DRAFT

AUTOMATED FLIGHT SERVICE STATION VOICE SWITCH (AFSSVS) SYSTEM

STATEMENT OF WORK

DTFA01-00-R-FSSVS

DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION
AUTOMATED FLIGHT SERVICE STATION VOICE SWITCH
INTEGRATED PRODUCT TEAM

REVISION November 28, 2000

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C1.0 STATEMENT OF WORK

C1.1 Overview

Flight Service Stations (FSSs) provide several essential services to users of the national airspace system (NAS). These services include preflight weather briefings, airport advisories, acceptance of flight plans, en route (real-time) weather advisories, broadcast weather information, Notice to Airmen classification and dissemination, monitoring of emergency communications radio frequencies, search and rescue initiation and coordination, and air/ground communications services for commercial, general aviation, and military pilots.

There are 61 automated FSSs (AFSSs) located throughout the United States, Alaska and Puerto Rico. In Alaska, there are 14 non-automated FSSs situated in remote areas that generally are accessible only by air. Although much smaller and less sophisticated than the AFSSs, the FSSs play a critical role in delivering air traffic services, as well as advisory information, to aircraft in these remote areas.

The Type III Integrated Communications Switching System (ICSS) currently provides the voice switching capability at the 61 AFSSs. The Type III ICSS is an analog voice switch fielded in the 1980s. Of the 14 non-automated FSSs in Alaska, eight (8) have electromechanical voice switches of mid-1960s vintage, and six (6) have Small Tower Voice Switches (STVSs) that were installed in the late 1990s.

Mission Need Statement (MNS) 320, *Voice Switching Capability for Flight Service Stations*, describes the need to sustain and enhance FSS voice switching capability through the next decade. The principal enhancement sought is the capability that will enable transfer of air/ground calls from a given AFSS to other AFSS(s). With such a capability, some AFSSs could cease operations during periods of low demand for flight services. Implementation of air/ground call transfer will require the following:

- A call transfer capability associated with the voice switch at each AFSS which is to operate on a part-time basis.
- A supporting ground telecommunications service to enable AFSSs to off load air/ground frequencies while operating in a part time mode.

The Automated Flight Service Station Voice Switch (AFSSVS) program will replace all ICSSs with competitively acquired new voice switching systems with the call transfer capability. The new voice switching systems would be modular and scalable, utilize digital technology and techniques, and be based on open standards to allow continuing compatibility through technology insertion.

In Alaska, the plan is to replace the eight (8) electro-mechanical voices switches in their non-automated FSSs with STVSs, thereby bringing all 14 FSSs to a common and supportable STVS baseline. Alaska's FSSs do not require the call transfer capability.

The need for 65 AFSSVS systems has been identified. In addition to the 61 AFSSVS system that will be deployed to operational AFSS locations, four (4) AFSSVS systems are needed by Government support activities. Two (2) systems will be delivered to the William J. Hughes Technical Center in Atlantic City, New Jersey for Government first article and operational testing; and two (2) systems will be delivered to the Mike Monroney Aeronautical Center in Oklahoma City, OK, for use in airway facilities (AF) training and operational support activities. The FAA Academy has also identified the need for an AFSSVS simulator to support resident air traffic (AT) specialist training.

The AFSSVS life cycle is anticipated to be 10 years, calculated from date of the last installation.

The Government will implement security functions and conduct security assurance activities to protect the AFSSVS. Information System Security (ISS) requirements for the AFSSVS are found in the AFSSVS Protection Profile (PP). The PP describes the Target of Evaluation (TOE); which includes the AFSSVS, its interfaces, and its associated documentation; a description of the TOE security environment; the TOE security objectives; technical security requirements; and the rationale behind those requirements. It identifies requirements to be met by the Government as well as those to be met by the contractor. It does not specify how security requirements are to be implemented.

Details of how the contractor's security requirements will be implemented are contained in the contractor's response to the PP, a document known as the Security Target (ST). When complete, the PP will be included in the Government's Security Certification and Authorization Package (SCAP).

C1.2 Purpose

This Statement of Work (SOW) identifies the tasks that the Contractor shall be required to perform to satisfy the Federal Aviation Administration's (FAA's) requirements described in the AFSSVS Specification, ***FAA-E-xxxx*** and the AFSSVS Information System Security (ISS) Protection Profile.

C2.0 APPLICABLE DOCUMENTS

C2.1 Government Documents

The following reference documents, version in effect as of the date of the Screening Information Request (SIR), form a part of this SOW and are applicable to the extent specified herein. In the event a document referenced herein has been withdrawn or cancelled by the FAA, the document version in effect on the date of withdrawal or cancellation shall be used.

a. Department of Transportation (DOT) Documents

DOT/FAA/CT-96/1 Human Factors Design Guide (January 1996)

DOT/FAA/RD-95/3 Human Factors in the Design and Evaluation of Air Traffic Control Systems (April 1995)

b. Federal (FED) Standards

FED-STD-5(f) Standard Guide for Preparation of Proposed Item Logistics Data Records and Proposed Item Identifications by Government Suppliers (April 23, 1982)

FIPS PUB 102 Guideline for Computer Security Certification and Accreditation

c. Federal Aviation Administration (FAA) Documents

(1) Specifications

FAA-C-1217F Electrical Work, Interior (January 1991)

FAA-D-2494/b Technical Instruction Book Manuscript: Electronic, Electrical, and Mechanical Equipment, Requirements for Preparation of Manuscript and Production of Books (March 14, 1984)

FAA-E-2911 National Airspace System (NAS) System Level Specification – National Airspace System (NAS) Infrastructure Management System (NIMS) Managed Subsystem

FAA-E-xxxx AFSSVS Specification

FAA-G-1375 Spare Parts Peculiar for Electronic, Electrical, and Mechanical Equipment, (April 21, 1988)

FAA-G-2100G Electronic Equipment, General Requirements (November 1993)

(2) Standards

FAA-STD-016A Quality Control Systems Requirements (September 21, 1987)

FAA-STD-019B Lightning Protection, Grounding, Bonding, and Shielding Requirements for Facilities (Aug 28, 1990)

FAA-STD-020B Transient Protection, Grounding, Bonding, and Shielding Requirements for Equipment (May 11, 1992)

FAA-STD-024	Preparation of Test and Evaluation Documentation (August 17, 1987)
FAA-STD-028C	Contract Training Programs (Draft), (September 2000)
FAA-STD-2706	Preparation and Validation of Theory of Operations Examinations
FAA-STD-2781	Preparation and Validation for Performance Examinations
FAA	Acquisition Management System Test and Evaluation Process Guidelines (December 1999)
FAA	Draft AFSSVS Protection Profile, Version 1 (October 27, 2000)

(3) Interface Requirements Documents (IRDs)

NAS-IC-51070000-1	Interface Control Document - NAS Infrastructure Management System Manager/Managed Subsystem using the Simple Network Management Protocol Version 1 (SNMPv1)
NAS-IR-51070000	Interface Requirements Document - NAS Infrastructure Management System Manager

(4) FAA Orders

Order 1370.82	Information Systems Security Program (June 9, 2000)
Order 1800.58C	National Airspace (NAS) Integrated Logistics Support Policy
Order 6000.30B	Policy for Maintenance of the NAS through the Year 2000
Order N3000.65	Contract Training Program

d. Military (MIL) Specifications

MIL-T-31000	General Specifications for Technical Data Packages
MIL-PRG-49506	Performance Specification, Logistics Management Information

e. Military (MIL) Standards

MIL-STD-470	Maintainability Program Requirements (for Systems and Equipment)
MIL-STD-471A, Note 2	Maintainability Verification/Demonstration Evaluation

MIL-STD-785	Reliability Program for Systems and Equipment Development and Production
MIL-STD-973	Configuration Management
MIL-STD-1472D	Military Standard Human Engineering Design Criteria for Military Systems, Equipment and Facilities, March 1989
MIL-STD-1629A	Procedures for Performing a Failure Mode Effects and Criticality Analysis (November 28, 1984)

C2.2 Non-Government Documents

The following documents form a part of this statement of work (SOW) and are applicable to the extent specified herein.

a. Standards

American Society for Testing and Materials

ASTM-D-3951	Standard Practices for Commercial Packaging (March 8, 1983)

BCS Techologies

DSP-1000	Computer Supported Telecommunications Applications (CSTA) Interface Guide (October 1, 1996)

International Organization for Standardization/International Electromechanical Commission (ISO/IEC

ISO 9000	Quality Management and Quality Assurance Standard
ISO/IEC 15408	Common Criteria for Information Technology Security Evaluation (August 1999)

National Institute of Standards and Technology

NIST Special Publication 800-18	Guide for Developing Security Plans for Information Technology Systems (December 1998)

Uniform Code Council / Incorporated/EAN, International (UCC/EAN)

UCC/EAN Code 128	Bar Code Symbology Standard

b. Other Publications

National Fire Protection Association, Inc (NFPA)

NFPA-70	National Electrical Code, 1993

C2.3 Sources of Documents

Copies of this SOW and other applicable FAA specifications and standards may be obtained from the Contracting Officer, ASU-330, issuing the Screening Information Request (SIR). Requests will fully identify the documentation desired, i.e., document type (specification, Standard, Order), title, and date. Requests will cite the screening information request, contract involved, and purpose for the requested material. FAA Century Date Change requirements can be obtained from the Office of Information Technology Internet Web Page, http://www.faa.gov/ait. The FAA "Test and Evaluation Guidance Document" is available on the Internet at http://fast.faa.gov/test_evaluation/pg4.html.

Single copies of unclassified Federal and military specifications and standards may be obtained by writing to the Naval Publications and Forms Center (NPFC), 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120, or by calling the NPFC (215-697-3321) Monday through Friday, between the hours of 8:00 a.m. to 4:30 p.m. (Eastern Time). The NPFC is the Department of Defense Single Stock Point (DOD-SSP) and distribution center for unclassified specifications and standards.

American National Standard Institute (ANSI), International Organization for Standardization (ISO), and American Society for Quality Control (ASQC) documents can be obtained from:

American Society for Quality
611 East Wisconsin Avenue
P.O. Box 3005
Milwaukee, WI 53201-3005
Telephone 800-248-1946 or 414-272-8575, Fax 414-272-1734

National Institute of Standards and Technology (NIST) documents can be obtained from:
http://csrc.nist.gov/publications/welcome.html

C2.4 Precedence of Documents

If the requirements of this SOW or subsidiary document(s) are in conflict, the SOW shall have precedence. In the event of a conflict between FAA document(s) and military and Federal document(s), FAA document(s) shall have precedence. The Contractor shall immediately notify the Government Contracting Officer of any conflict(s) detected between any documentation used in this SOW.

C2.5 Terminology

For the purpose of simplicity, the Automated Flight Service Station Voice Switch (AFSSVS) system will hereinafter be referred to as "AFSSVS." All references to "Government" and "FAA" shall mean the FAA Contracting Officer (CO) assigned to the AFSSVS procurement.

Screening Information Request (SIR) shall be used in lieu of invitation for bid (IFB) or request for proposal (RFP) per the FAA Acquisition Management System (AMS).

C3.0 CONTRACTOR TASKS

The Contractor shall design, implement, and verify AFSSVS equipment in accordance with the functional requirements contained in the AFSSVS Specification.. AFSSVS equipment to be used by the air traffic control specialist shall be designed to fit into GFE (i.e. Operational and Supportability Implementation System (OASIS)) consoles.

The Contractor shall prepare SOW deliverables in accordance with the contract data requirements list (CDRL) and the associated data item description (DID). Deliverables referenced throughout this SOW by their CDRL titles are to be performed in accordance with the CDRL of the same name even when the CDRL or DID number is not specified.

The Contractor shall make maximum use of commercial-off-the-shelf/modified commercial-off-the-shelf (COTS/MCOTS) and non-developmental item (NDI) parts/components that have demonstrated high reliability. The Contractor shall provide the Government copies of the data collected and the analysis performed that substantiates that the parts/components used in their proposed system have demonstrated high reliability. For purposes of this procurement, the term COTS shall be understood to mean material available from a wide variety of sources as a commercial product and currently in use in the Government or commercial market place.

The Contractor shall provide and deliver to the Government all COTS/MCOTS executable (loadable) software used in the AFSSVS. The Contractor:

a. Shall provide fully paid-up software licenses and the associated documents needed to maintain the computational software for all software required under this contract.

b Shall provide the Government with the authorization to prepare back-up copies of all software used in the AFSSVS without restriction.

c. Shall be responsible for the maintenance of the software beginning with the delivery of the first system (i.e., the WJHTC test-bed) and as specified in the AFSSVS contract.

d. Shall test and validate all proposed AFSSVS software modifications and updates before they are delivered to the Government.

e. Shall provide the Government copies of all the validated software updates and modifications (e.g., routine updates to improve performance, enhance maintenance operations, correct system shortcomings, etc.,) and the associated test procedures.

f. Shall assist the Government in software verification, integration, and regression testing as specified in the AFSSVS contract.

g. Shall describe the plan for accommodating software upgrades and future version changes in the program management plan. (CDRL PGM001)

C3.1 Program Management

The Contractor shall establish an AFSSVS management program to plan, organize, direct, and control all the activities necessary to meet the requirements of the AFSSVS SOW and Specification. The Contractor shall assign a Program Manager who shall have the responsibility for controlling and coordinating all work to be performed. The Program Manager shall have the resources and the authority to ensure efficient and timely program execution and shall be the single focal point within the Contractor's activity for all required program tasks. The Program Manager shall be prepared at all times to discuss, with the Contracting Officer (CO) and/or the Contracting Officer's Technical Representative (COTR), the current status of all contract requirements. The Contractor's Program Manager, first level managers, and sub-contractor program manager(s) are considered key personnel and shall be subject to the key personnel provisions of this contract. The Contractor shall not change key personnel within its organization or major sub-contractor's organization for one year after award of the AFSSVS contract without notifying the Government. The Contractor shall inform the Government via electronic mail within 72 hours of the occurrence of any internal key personnel changes. The Contractor shall continuously monitor the technical performance of this contract and of related subcontracts that are under the Contractor's control.

C3.1.1 Program Management Plan

The Contractor shall prepare, deliver, and maintain a program management plan (PMP) (CDRL PGM001). The PMP shall describe the Contractor's organization and internal lines of communication, assignment of management and engineering responsibilities and duties, data management structure and procedures, resources plan for the conduct of contractually imposed tasks, decision making process, plan for accommodating software upgrades and version changes, and the program milestone schedule.

C3.1.2 Program Control

The Contractor shall implement a system for program control, or in the event such a system already exists, shall utilize that system for internal schedule performance, control, and measurement. The Contractor shall provide a cost/schedule status report (C/SSR) (CDRL PGM002). The Contractor shall determine the general management procedures to be used in each and all major program and functional areas. The Contractor shall maintain total data management, including monitoring, reporting, status accounting, and correlating (e.g., Government change requirements versus implemented changes) all changes to the CDRL contents. The Contractor shall maintain a database to track the status of all problem reports (hardware and software) and maintain records to verify corrective action. The Contractor shall control the generation, receipt, approval, storage, and delivery of subcontractor data. The Contractor shall ensure that sub-contractor data satisfies all of the engineering, logistics, and technical requirements of the contract.

C3.1.3 Network Logic Schedule (NLS)

The Contractor shall prepare and deliver a Network Logic Schedule (NLS). The NLS shall show the flow of work necessary to accomplish major program objectives and deliverables of the AFSSVS. The purpose of the NLS is to show the dependency of the events and activities, and to determine the longest or most critical path of these dependencies from start to program completion. The NLS shall be used by the Government to assure planning by the Contractor has been done and is in sufficient detail to evaluate total program cost, schedule, technical progress, or alternate courses of accomplishing work and to pretest schedule change decisions prior to implementation to determine affect on downstream events. The schedule shall be updated every two months and a schedule status provided at each program management review (PMR). (CDRL PGM003)

C3.1.4 System Requirement Allocation Document (SRAD)

The Contractor shall develop a system requirements allocation document (SRAD) that describes the allocation of AFSSVS requirements to the Contractor's equipment. The requirements allocation document shall describe the system in terms of NDI hardware and software as they relate to hardware configuration items (HWCIs) and computer software configuration items (CSCIs) and shall include sufficient detail to reflect all requirements, including derived requirements. (CDRL PGM004)

C3.2 Conferences, Meetings, and Reviews

As a part of their program management responsibilities, the Contractor shall plan, support, conduct, and participate in the following conferences, meetings, and reviews as specified in this SOW/Contract. When the Contractor is the host, the Contractor shall prepare and submit the proposed agenda (CDRL ADM001) and the minutes (CDRL ADM002) for Government approval. The Contractor shall ensure the participation of key and knowledgeable personnel to support the topics identified in the Government approved agenda. There shall be a free exchange of ideas between the Contractor and the Government in order to establish AFSSVS program progress and to identify technical problems and the action plans required to resolve the problems in a timely manner.

The Government will be responsible for preparing the agenda/minutes for meeting(s) scheduled at other than AFSSVS Contractor facilities.

C3.2.1 Post Award Conference

The Contractor shall plan, host, provide administrative support, and participate in a Post Award Conference (PAC) to be held at the Contractor's facility following contract award. The

Government will determine the actual date of the PAC, which is to occur no later than 60 days after the contract award date. During the PAC, the Contractor shall brief their plans and schedule for satisfying each of the SOW requirements. The PAC agenda shall include a provisioning guidance conference (PGC), a training guidance conference (TGC), and an interchange session to review logistics management information (LMI) requirements. (CDRL ADM001, ADM002)

C3.2.2 Program Management Review (PMR)

The Contractor shall plan, prepare, conduct, and provide administrative support for quarterly program management reviews (PMRs). Each PMR shall include a review of the technical, schedule, and cost aspects of contract performance, program accomplishments (e.g., milestones met), problems, risks, forecasts, open action items from previous meetings, and subcontractor activities. The first PMR shall be held in conjunction with the **post award conference** (PAC). The Contractor shall prepare the agenda and minutes (CDRLs ADM001, ADM002)**.** The agenda shall include Contractor briefings on the status of the AFSSVS program and contract deliverables (technical documentation, logistics, training, etc), issues and concerns, program schedule, problems, and open action items and action plans. The Contractor shall ensure the participation of key and knowledgeable technical personnel, including subcontractor personnel, for each of the topics identified in the agenda.

PMRs shall be held at the Contractor's facility, unless otherwise directed by the Government.

Since personnel involved in National Airway Integrated Logistics Support Management Team (NAILSMT) meetings are also participants in PMRs, the Government reserves the right to schedule joint Government/Contractor NAILSMTs in conjunction with the PMR or as a separate meeting. (CDRLs ADM001, ADM002)

C3.2.3 Preliminary System Review (PSR)

The Contractor shall conduct a preliminary system review (PSR) within 30 days following the delivery of the preliminary system requirements allocation document (SRAD) (CDRL PGM004). During the PSR, the Contractor shall present data to validate their approach to meeting the technical, business, and support requirements of the AFSSVS contract; and data allocating the requirements of the AFSSVS Specification to system specific HWCIs and CSCIs. The Contractor shall also discuss the following topics as applicable to the propose system design:

a. Trade-studies and design studies results;
b. Functional flow, requirements allocation, and schematic diagrams;
c. Equipment layout drawings, including any proprietary designs, processes and information;
d. Environmental control design aspects;
e. Electromagnetic compatibility of system design;
f. Power distribution and grounding design aspects;

g. Mechanical and packaging design of OASIS consoles, racks, printed circuit boards, connectors, etc.;
h. Safety engineering considerations;
i. Security engineering considerations, including password protection and levels of security access to the system;
j. Lists of materials, parts, and processes;
k. System reliability/maintainability/availability;
l. System weight;
m. Interface requirements allocated to configuration items and interface control data derived from requirements;
n. Mock-ups, models, breadboards, or other hardware as appropriate to display capability;
o. Producibility and manufacturing considerations (e.g., materials, tooling, test equipment, processes, facilities), and identification of single, sole, and diminishing source.
p. Documentation planned for supporting the contract;
q. Firmware to be provided with the system;
r. CSCI functional flow;
s. CSCI structure (top level structure);
t. Computer software development and support facilities;
u. Human factors considerations of design;
v. Test and Evaluation program to reduce risk.
(CDRL ADM001, ADM002)

C3.2.4 Final System Review (FSR)

As ordered by the Government, the Contractor shall conduct a final system review (FSR) to review and verify specific system solutions proposed for the AFSSVS Specification requirements, prior to start of the formal qualification test (FQT). The FSR shall address the pre-test system configuration and the technical and schedule risks associated with each HWCI/CSCI; and shall include the resolution of all problems identified during the PSR, and prior technical interchange meetings (TIMs) and SRAD reviews. The FSR shall be held within 30 days of the PSR. The SRAD will be finalized during the FSR. (CDRL ADM001, ADM002 , PGM004)

C3.2.5 Technical Interchange Meetings (TIMs)

At the request of the Government or of the Contractor, Technical Interchange Meetings (TIMs) may be scheduled to discuss any issues, e.g., technical, logistics, and training that require mutual resolution or further clarification. The Government shall approve all requests for TIMs initiated by the Contractor. The Government or the Contractor shall initiate written or telephonic notification of the need for a TIM no later than three days prior to the desired date for the TIM. Unless otherwise specified by the Government, TIMs will be held at the Contractor's facility. (CDRL ADM001, ADM002)

C3.3 Reports

C3.3.1 Program Status Report (PSR)

The Contractor shall develop and deliver to the Government a monthly program status report that provides an assessment of the program's progress, identifies problems encountered or foreseen, updates the program schedule, and provides the status of any open action items assigned to the Contractor during Technical Interchange Meetings (TIMs) or Program Status Reviews. (CDRL PGM005).

C3.3.2 Contractor Work Breakdown Structure (CWBS)

The Contractor shall prepare and deliver a preliminary work breakdown structure (WBS) as part of the proposal, and a final WBS one week after contract award. (CDRL PGM006).

C3.4 AFSSVS Test Program

The Contractor shall appoint an experienced test manager to function as the Contractor' test interface with the Government. The test manager shall be responsible to the Contractor's program manager for all aspects of testing as it relates to this contract.

The Contractor shall develop and implement a test program to verify the system's physical, functional, and performance requirements both in the production facility and at each delivered site.

The Contractor shall furnish equipment, space, test plans and procedures, and personnel to accomplish all testing performed in the Contractor's facility. The Contractor shall furnish the test equipment, tools, test plans and procedures, and personnel required for installing and testing equipment at AFSSVS sites.

C3.4.1 Contractor Master Test Plan (CMTP)

The Contractor shall prepare and deliver a Contractor master test plan (CMTP) (CDRL TES001**)** for the AFSSVS. The CMTP shall include the Contractor's test concept, plan for test management, data collection and evaluation, reports to be delivered to the Government, and the verification requirements traceability matrix (VRTM) that identifies each **FAA-E-xxxx** requirement with the procedures that will be used to demonstrate compliance with **FAA-E-xxxx**. When approved by the Government, the CMTP shall serve as the overall test control document for the Contractor's AFSSVS test program.

C3.4.1.1 Test Plans and Procedures

The Contractor shall prepare a test plan and test procedures for all Contractor tests, i.e., software integration test (SWIT) (CDRL TES002), formal qualification test (FQT) (CDRL TES003), production acceptance tests (PAT) (CDRL TES004), and site acceptance tests (SAT) (CDRL TES005). No testing shall commence until the plan and procedures have been reviewed and approved by the Government. Unless otherwise directed by the Government, all procedures shall be written in accordance with FAA-STD-024, and shall contain the step-by-step instructions for the set up/conduct of each test, and the collection of data during each test run. Test procedures for each test shall include the data collection forms, discrepancy report forms (i.e., program trouble report (PTR)), and test log forms.

Where tests are repetitive in nature, such as PAT (CDRL TES004) and SAT (CDRL TES005), the development and submittal of a single, generic test plan and procedures shall be permitted with Government approval.

The Contractor shall develop and submit to the Government separate test plans and procedures for each of the following tests:

a. Software Integration Test (SWIT): The Contractor shall develop a SWIT Plan and Test Procedures (CDRL TES002) and conduct SWIT activities (i.e., unit, CSCI and system software integration testing) at the Contractor's facility. The purpose of SWIT shall be to verify that specific functional threads have been properly implemented. After Government approval, the Contractor shall use the SWIT Plan/Procedures to conduct testing on developmental items and prepare a SWIT report (CDRL TES007). If a developmental item(s) fails any part of the test process, the problem shall be corrected and the item(s) subjected to re-testing. All tests shall be repeated from the beginning, unless the Contracting Officer Technical Representative (COTR) directs otherwise.

   (1) SWIT entrance criteria requires:
   - The requirements have been baselined.
   - The Contractor Master Test Plan (CMTP) has been completed and is approved.
   - The functional thread coding and the development of test cases/ procedures have been completed.

   (2) SWIT exit criteria requires:
   - All designated functional threads have been tested and problem trouble reports (PTRs) have been generated for each failure.
   - All PTRs have been resolved/fixed or deferred to a later date with Government approval.
   - All corrected functional threads have been re-tested and the PTRs verified to have been satisfactorily corrected.

b. Formal Qualification Test (FQT): The Contractor shall prepare a FQT Plan and Test Procedures (CDRL TES003), and conduct FQT activities the Contractor's facility. The purpose of FQT shall be to:

- Verify Contractor compliance to contracted functional, performance, and interface requirements identified in the AFSSVS Specification and Verification Requirements Traceability Matrix (VRTM). (CDRL TES001)
- Identify deficiencies in software and documentation.
- Identify deficiencies in system design and documentation, the NAS, hardware, and software.
- Verify the integrated voice switch product meets all system specification requirements.

(1) FQT entrance criteria requires:

- AFSSVS software is functional, allocated and design baselines are established.
- Successful completion of the test readiness review (TRR).
- Government approved CMTP, VRTM, software test plan, and software test description and test procedures.
- System Specification baselined and approved by the Government.
- Configuration Management Plan approved by the Government.

(2) FQT exit criteria requires:

- All test cases have been executed and PTRs have been generated for each failure.
- All PTRs have been resolved/fixed or deferred to a later release with Government approval.
- All changes made as a result of PTRs have been regression tested and the PTRs verified to have been satisfactorily corrected.
- The test report has been reviewed and approved by the Government.
- The Contractor has updated all required documentation to reflect changes made during testing.
- Successful completion of FCA/PCA. (CDRL CMP003, CMP004)

(3) In addition to verification of all Specification requirements, Contractor FQT shall include provisions for:

- FCC Registration;
- Intelligibility Test;
- Electromagnetic Compatibility (EMI, EMC, Radar Pulse) Tests;
- Electrostatic Discharge (ESD) Test;
- Reliability Testing;
  - (a) The test length will be determined by the AFSSVS specified MTBF requirement as theta sub zero.
  - (b) All problems identified during the reliability qualification testing (RQT) shall have a corrective action plan submitted for approval by the buying agency prior to implementation by the Contractor.
  - (c) All failures and discrepancies reported during the RQT shall be provided to the Government in a RQT test report. (CDRL TES009))

- System Maintainability Demonstration (M-Demo);
- Communications Test Loading.

c. Production Acceptance Test (PAT) and Site Acceptance Test (SAT): The Contractor shall prepare a PAT (CDRL TES004) and SAT (CDRL TES005) Plan and Test Procedures. The Contractor shall conduct PAT activities at the Contractor's facility and SAT activities at each AFSSVS location. The purpose of PAT and SAT shall be to:
   - Verify that the production unit is configured to requirements established for the destination site.
   - Verify that production units are free from manufacturing defects.
   - Verify that installation and integration of the fielded system is consistent with approved plans.

   (1) PAT and SAT entrance criteria requires:
      - FQT has been successfully completed.

   (2) PAT and SAT exit criteria requires:
      - All production test cases applicable to the system under test have been successfully executed.
      - Any hardware or site configuration issues identified during PAT and SAT have been successfully resolved prior to completion of PAT and SAT.
      - The Government has evaluated any software issues identified during PAT and SAT and a corrective action plan has been established prior to the completion of PAT and SAT, as appropriate.

C3.4.1.2 Conduct of Tests

The Contractor shall perform all testing required to verify the AFSSVS, as designed and implemented, satisfies the requirements of the AFSSVS specification, **FAA-E-xxxx**. This testing shall include a software integration test (SWIT), formal qualification test (FQT), in-plant production acceptance tests (PATs), and Site Acceptance Test (SAT) at each AFSSVS location. In the event the Contractor cannot provide Environmental, Electro-magnetic Interference (EMI), or Radio Frequency Interference (RFI) test data to verify the AFSSVS meets this criteria, then a Contractor selected/Government approved testing laboratory shall perform such testing. All test documentation developed in response to requirements contained herein shall conform to the format and content established by the Acquisition Management System Test and Evaluation Process Guidelines, Appendix C, "*Format and Content Guidance for T&E"*.

The Contractor shall conduct each test in accordance with following guidelines:

a. Tests shall be conducted in accordance with the Contractor developed and Government approved test plans and procedures. Deviation from the approved procedures can occur at the direction of the Government-appointed test director. All deviations from the

Government approved procedures shall be noted in the test log and redlined on the working procedures document.

b. The Contractor shall provide the Government a Notice of Intent to conduct test(s) (CDRL TES006).
   - The Contractor shall conduct a dry run using all the applicable test procedures and scenarios prior to scheduling a formal test.
   - For SWIT and FQT testing, the Contractor shall provide the Government not less than 20 calendar days advanced notice prior to the test start date and confirmation of the test starting date and expected length of the test 7 days in advance of the start of test.
   - For all other tests (e.g., PAT, SAT, dry runs, etc). the Contractor shall provide the Government 10 calendar days advance notice prior to the test start date.
   - All documentation (test plans and test procedures) related to the test to be performed shall be approved by the Government prior to issuance of the Notice of Intent.
   - The Contractor shall provide justification to the Government for any exception(s) to the 20 and 10 day requirements.

c. The Contractor shall conduct a test readiness review (TRR) for the Government prior to the start of SWIT and FQT. Purpose of the TRR shall be to verify the Contractor's planning and preparation for the test(s) (CDRL ADM001, ADM002**)**. During the TRR, the Contractor shall address the following topics:
   - Requirements changes. Identify and discuss all changes to the AFSSVS specification that have been approved and have impact on the test.
   - Design changes. Identify and discuss all changes to the Contractor's AFSSVS design that have been applied since the PSR and FSR, and have impact on the testing.
   - Test plan changes. Identify and discuss all changes to the Government approved Contractor master test plan (CMTP). (CDRL TES001)
   - Test procedures. Provide complete sets of Contractor prepared and Government approved test procedures to be used during the test and identify all procedure changes.
   - Dry run test cases, procedures, and results. Conduct informal dry runs of the test procedures.
   - Test resources. Provide an update on the status of test personnel, test equipment, and test facilities.
   - Test limitations. Identify all test limitations imposed by schedule, performance, or other program limitations.
   - System problems. Provide a summary of all pending discrepancy reports that will not be resolved prior to start of test.
   - Schedule. Provide a schedule for all of the planned test activities.
   - Documentation updates. Provide updates for all of the documentation to be used during the test.

d. The Contractor shall brief the Government-appointed test director or designated representative prior to the start of each test. The briefing shall describe the Contractor's

readiness for the test, the objective(s) of the test, a description of the test scenarios, and the expected test results. During the test period, the Contractor shall provide daily pre- and post-run test briefings. Pre-test briefings shall explain the day's schedule test runs and the expected results. Post-test briefings shall provide a synopsis of the day's test results and significant events.

e. Prior to the start of test, the system under test shall undergo a unit-under-test baseline inspection by the designated Government representative. After the inspection, the Government representative will seal the system and establish the unit-under-test baseline configuration.

f. During testing, the Contractor shall respond to direction on test conduct only from the Government-appointed test director. The Government-appointed test director's authority will include ensuring the Contractor's compliance with the approved test plan and procedure governing the specific test. The Government reserves the right to add additional test observers during any phase of the testing.

g. The Contractor shall maintain an official test log containing test identification, description of the unit under test, copies of the calibration certificates for all test equipment, date and time of test, procedures, collected results, and discrepancy reports. The test log shall also record all changes to the unit-under-test configuration. After the test has been correctly performed and the Contractor has signed the results, the Government test director/designated representative who witnessed the Contractor's test will verify/co-sign the test results.

h. The Contractor shall record all test discrepancies (i.e., the Contractor deviated from the Government approved procedures without prior approval from the Government test director/designated representative or the system failed the tests) in the test log and on a program trouble report (PTR) form. The PTR shall identify the test procedure, the expected outcome, the actual outcome, and describe the circumstances for the discrepancy. The PTR report shall be signed by the Contractor's test director and the Government test director/designated representative. The Contractor shall maintain a file of all PTRs and related Government request for clarifications. The Contractor shall analyze the test results to determine if the results are acceptable. The Contractor's quality assurance (QA) manager shall report the results of the analysis and provide a recommendation to the Government test director. The Government will decide whether or not to accept the results or to require a retest. (CDRL TES007)

i. The Contractor shall submit request for deviation(s) or waiver(s) to test requirements to the Government test director. The Government may defer requirements that can not be verified during the current phase of testing. (CDRL TES008)

j. The Contractor shall prepare test reports for each test conducted. The test reports shall include copies of the test log, completed/authenticated test data collection sheets, tests and PTR reports, and an analysis of the test data, in a Government approved Contractor

format. The Contractor shall prepare updated reports to include the data collected and analyzed for any Government directed retesting. The Contractor shall deliver preliminary test reports within 15 days of completion of the test. (CDRL TES007)

k. The Government reserves the right to witness or actively participate in all tests, informal or formal, of the AFSSVS system or any subpart thereof, and to review any or all test data and results, including Contractor dry-run tests data. The Contractor shall permit the Government full and unencumbered access to all testing activities and related documentation.

C3.4.1.3 Retest

The Contractor shall correct all AFSSVS failures/discrepancies identified during testing. The Government reserves the right to determine the scope of retest, i.e., complete retest, partial retest (e.g., testing to demonstrate discrepancies/failures noted during the test have been resolved/fixed), or no retesting.

The Contractor shall document all fixes for the discrepancies/failures discovered during testing, and retest and validate the fixes. The Contractor shall notify the Government 10 working days prior to the start of the retest. With the notification, the Contractor shall provide a schedule and the agenda for the retest(s) and copies of the documentation supporting the retest, i.e., identification of the problem, the proposed modification, and the procedures that will be used during the test.

The retest shall be conducted in accordance with the original procedures, or as modified and approved by the Government. Retest shall be conducted in the presence of the Government-appointed test director/designated representative, who will witness all tests and validate the test results collected. (CDRL: TES002, TES003, TES004, TES005, TES006, TES007)

C3.5 AFSSVS Prime Mission Equipment

After the successful completion of Formal Qualification Test (FQT), the Contractor shall deliver and install first article systems (FAS) at the Federal Aviation Administration (FAA) William J. Hughes Technical Center (WJHTC), NJ, as described in the contract **(Sec B, F, and J)** for Government operational test and evaluation (OT&E). In preparation for OT&E, unless otherwise specified by the Government, the Contractor shall comply with the installation, integration, and acceptance requirements specified in Section C3.6 of this SOW. The Government will not start OT&E until the successful completion of site acceptance test (SAT).

C3.5.1 First Article Systems (FAS)

The first article AFSSVS systems shall be fully configurable and capable of meeting all core functional and performance requirements of the AFSSVS Specification, FAA-E-xxxx.

C3.5.1.1 FAS Site Spares

The Contractor shall deliver to the Government a list (CDRL FAS001) identifying all of the spares the Contractor plans to deliver with the FAS. The spares and quantities recommended shall support Government testing requirements and shall include spares that will not be normally provided to AFSSVS sites. The list shall be in Contractor format and shall identify each LRU/site spare's nomenclature, part number, national stock number if available, commercial and government entity (CAGE) code, and the quantity being provided. The Government will review and approve the site spares list. The Contractor shall deliver the FAS site spares with the FAS equipment.

C3.5.1.2 FAS Tools and Test Equipment (TTE)

The Contractor shall deliver to the Government a list (CDRL FAS002) identifying all the tools and test equipment (TTE), both common and special, that the Government will require to properly test and maintain the FAS. The list shall be in Contractor format and shall identify the TTE nomenclature, part number, manufacturer, purpose, the quantity required, and the purpose for each item (i.e., test, maintenance, test and maintenance). The quantity required shall take into consideration all test/maintenance procedures that require the use of more than one of the same type TTE.

The Contractor shall deliver to the WJHTC, all special/specialize TTE (STTE) required with the FAS equipment, including communications traffic loading generator(s), test cables, connectors, extender kits, adapter, software, documentation, and all other items required to permit use of the STTE. STTE is defined as items having single or peculiar application, are not commercially available, and are specifically built to service, test, adjust, and maintain specific AFSSVS components and subsystems.

C3.5.1.3 FAS Training

The Contractor shall provide the Government air traffic (AT) specialists and airway facilities (AF) specialists' familiarization training and supporting documentation on the FAS functions, capabilities, operations and maintenance. The purpose for this training is to enable AT/AF specialists to operate and maintain the AFSSVS during Government conducted FAS testing. The training and the documentation used shall be in Contractor format and shall be provided to the Government personnel scheduled to participate in the FAS testing activities. The Contractor shall provide the instructor(s) and course materials for three (3) AT specialist/operator classes and for three (3) AF maintenance specialist classes. The class size for each class will not exceed 12 students. At the completion of training, the AT specialist will be able to operate and the AF specialists will be able to maintain the FASs with minimum assistance from the Contractor. AT/AF participants in FAS training will be required to complete formal AFSSVS training when

it is available before being certified to perform AT/AF specialist's tasks at operational AFSSVS sites.

C3.5.1.4 FAS Contractor Services

Beginning with the installation of the FASs at the WJHTC, the Contractor shall provide on-site engineering, hardware and software technical and maintenance support services assistance until such time that the Government determines that such assistance is no longer required. As a minimum, the Contractor shall provide engineers with functional and operational knowledge of the FAS on site to support all Government AFSSVS test preparation and test conduct activities.

Technical and maintenance support services shall include providing on-the-job training (OJT) on the operation and limitations of the AFSSVS, ensuring AFSSVS system availability for test, resolving AFSSVS hardware, software, and interface problems, responding to Government request for AFSSVS system information, providing engineering assistance in software loads, configuration map data base updates, and Government reliability, maintainability, availability (RMA) testing.

Maintenance services, as required, will be ordered on a call out basis.

C3.5.1.5 FAS Faultable Circuit Card Assemblies

The Contractor shall deliver to the Government a set of faultable circuit card assemblies (CCAs) for use in the AFSSVS testing. The CCAs shall be in sufficient quantity and types to enable the Government to induce a wide range of failures into the AFSSVS FAS to exercise the built-in diagnostics capabilities and system troubleshooting procedures. The CCAs shall have the capability to induce either individual or multiple faults by connecting/disconnecting jumpers, dipswitches, or other devices and methods as deemed appropriate by the Contractor.

The Contractor shall provide the Government a faultable CCAs listing that includes the CCA part number or other identification, quantity of each CCA provided, and an identification of the fault(s) each CCA is designed to induce. The Contractor shall affix a part number or other identification to each CCA. (CDRL FAS003)

The Government may order additional set(s) of faultable CCAs to support the AFSSVS Hardware Maintenance Course (see Section 3.8.3.4). When installed faultable CCAs delivered to support training shall have the same external appearance as normal CCAs to prevent a student from identifying the faultable CCA(s) by external visual inspection alone.

When faultable CCAs are impacted by hardware or software changes to the point where they can no longer perform the function intended, the Contractor shall update or provide replacements for the affected faultable CCAs

C3.5.1.6 First Article Hardware Reconfiguration

The Contractor shall configure a FQT switch per a configuration to be provided by the Government that will be comprised of assets eventually to be delivered to three operational sites. This large FQT switch shall be used at the Contractor's facility to test a number of requirements such as the offloading capability. After the FQT testing, the Contractor shall be responsible for disassembly and reconfiguration of the assets into three switches for operational sites. These three switches will undergo all required testing for acceptance prior to shipment.

C3.5.2 AFSSVS Production Systems

After the completion of Government WJHTC OT&E, resolution of all major program trouble reports (PTRs), Government approval of the Functional Configuration/Physical Configuration Audits (FCA/PCA) (CDRLs CMP003/CMP004)**,** and direction from the Government, the Contractor shall deliver production systems in accordance with **Section B, F, and J** of this contract.

C3.5.2.1 AFSSVS Production System Acceptance Criteria

The Contractor shall verify that each production system is free from manufacturing defects, and is substantially identical to the first article system. The Government at the Contractor's facility shall perform final acceptance for each production system. After successful completion of the final acceptance inspection, the Government will issue DOT/FAA Form 256, *Inspection Report of Material and/or Services*, to the Contractor.

C3.5.2.2 AFSSVS Production Systems Delivery

The Contractor shall deliver production systems in accordance with Sections B, F, and J of this contract.

C3.5.3 AFSSVS Interfaces

C3.5.3.1 Automatic Call Director/Voice Retrieval System (ACD/VRS)

The Contractor shall provide total integration of the ACD position equipment in use at each AFSS into each position of the AFSSVS system. Refer to Appendix B of this SOW for the ACD requirements as specified in the Computer Supported Telecommunications Applications (CSTA) Interface Guide and the AFSSVS Specification.

C3.5.3.2 Transfer/Rerouting of Communications

The Contractor shall provide transfer/rerouting of communications, also referred to as offloading, capabilities with the AFSSVS system as identified in the Concept of Use Document found at Appendix C of this SOW and as described in the AFSSVS Specification.

C3.5.3.3 Information Security (INFOSEC)

The Contractor shall provide information security and satisfy information security requirements with the AFSSVS System as identified in the AFSSVS Protection Profile found at Appendix D of this SOW and as described in the AFSSVS Specification.

C3.5.3.4 RMM/NIMS

The Contractor shall provide Remote Maintenance Monitoring & Control/NAS Infrastructure Management System (RMMC/NIMS) requirements as specified at Appendix K of the AFSSVS Specification.

C3.5.3.5 Human Interface

The Contractor shall satisfy the human interface requirements specified at Appendix K of the AFSSVS Specification. Appendix E of this SOW provides an AFSSVS CHI prototype description developed by the FAA.

C3.6 Installation, Integration, and Acceptance

The Contractor shall deliver to and install, integrate, and test the AFSSVS at Government designated sites in accordance with the Contract and the Site Installation Management Plan (SIMP) (CDRL IMP001) and site specific Site Installation, Integration, and Acceptance Test Document (SIIATD-SS) (CDRL IMP003). The Contractor shall provide the personnel, tools and test equipment, software, materials, and services required for this requirement. The Contractor shall provide full-time supervision and direction of contractor/subcontractor personnel during all phases of the installation activity. The Contractor shall assign a site installation manager to function as the Contractor's on-site interface with the Government. The site installation manager shall be responsible to the Contractor's program manager and shall be responsible for integration, control, and coordination of all installation activities.

C3.6.1 Site Installation Planning

The Contractor shall develop documentation describing the planning and execution of the AFSSVS installation, integration, and acceptance testing. Documentation required includes a

Site Installation Management Plan (SIMP) (CDRL IMP001), Site Installation, Integration, and Acceptance Test Document-Generic (SIIATD-G) (CDRL IMP002), and the SIIATD site specific data (SIIATD-SS) (CDRL IMP003).

C3.6.1.1 Site Installation Management Plan (SIMP)

The Contractor shall prepare a SIMP (CDRL IMP001) governing all site installation activities. The SIMP shall include the Contractor's approach to managing and implementing the installation, integration, and acceptance testing of the AFSSVS. When approved by the Government, the SIMP shall be used as the guideline for the coordination and conduct of all AFSSVS installation activities.

The Contractor shall develop and include a set of site survey worksheets and checklist as part of the SIMP. The site survey checklist shall identify the key technical elements of information (e.g., availability and location of power, communication lines and interfaces, cabling, grounding, and ducting, Government modifications (e.g. facility modifications required to allow access and installation of cable, conduit, and back room and position equipment) required by the Contractor to configure and to properly install the AFSSVS at each site. Government and Contractor personnel performing AFSSVS site surveys shall use the approved worksheets.

C3.6.1.2 Site Installation, Integration, and Acceptance Test Document (SIIATD)

The Contractor shall prepare a Generic Site Installation, Integration, and Acceptance Test Document (SIIATD-G) (CDRL IMP002). The SIIATD-G shall provide the generic plan for the installation, integration, checkout, and site acceptance testing of the AFSSVS. The installation and integration instructions shall identify facility access requirements in terms of the delivery, staging, storage, and installation of the AFSSVS.

After reviewing the site survey worksheets, the Contractor shall provide as an addendum to the generic SIIATD-G a tailored set of test procedures (CDRL TES005) that will be used during the site acceptance test on the site's AFSSVS configuration. The addendum shall also identify any site-specific equipment delivery and installation requirements provided by Government site personnel during the site survey.

C3.6.1.3 Site Installation and Checkout Items (INCO)

The Contractor shall prepare and deliver a site installation and checkout list that identifies all of the materials required for installing the AFSSVS, and the spares and repair parts needed to support SAT. (CDRL IMP004)

C3.6.1.4 Site Survey

As ordered by the Government, the Contractor shall conduct a detailed site survey in conjunction with designated Government representatives to determine each site's AFSSVS configuration and Contractor/Government site preparation requirements. The Contractor shall use the Government approved site survey worksheets developed and delivered as part of the SIMP. The Contractor shall begin the conduct of the site survey within 15 days of receipt of the Government order or as specified in Section F of the contract, whichever date is later. (CDRL IMP001)

While performing site survey activities, Contractor personnel shall abide by all Government security requirements in effect at the site.

The Contractor shall deliver the completed site survey report (CDRL IMP005), including the completed site survey worksheets to the Government.

C3.6.2 Site Installation

The Contractor shall be responsible for all Contractor AFSSVS site installation activities.

C3.6.2.1 Moves, Changes, and Relocations

As ordered by the Government, the Contractor shall provide technicians and general labor category personnel to provide services at facilities where AFSSVS hardware is being, has been, or will be installed by the Contractor. The technicians provided by the Contractor shall be familiar with operation and maintenance of the AFSSVS system and shall be responsible for supervising the general labor category personnel when used. The services shall include the moving, modifying, and relocating of AFSSVS hardware or associated equipment. These services shall be exclusive of those provisioned under the fixed price provisions of this contract and shall be covered by task orders under CLIN 0017.

C3.6.2.2 Packing, Shipping, Off-Loading, and Placement

The Contractor shall be responsible for the packing, shipping, and delivery of all AFSSVS equipment and material from the Contractor's facility to the designated Government site. The Contractor shall be on-site to accept delivery of the equipment and shall provide any material handling equipment (MHE) required for off-loading and moving the equipment from the receiving dock to the location where it is to be staged/installed. The Contractor shall remove all AFSSVS equipment packing and shipping materials and other installation generated trash from the site.

C3.6.2.3 AFSSVS Equipment Installation

The Contractor shall physically install AFSSVS and position equipment in the Government designated locations within the facility. The Contractor shall supply all mounting hardware and

tools necessary to attach the AFSSVS equipment to rack assemblies, facility flooring, or other connection points as required.

During the AFSSVS installation, the Contractor shall amend the site drawings to reflect any changes, revisions, or additions. This amending process applies to all site-specific Contractor generated drawings and to any Government generated facility drawings that were site adapted during installation. These standard drawings shall be amended with the appropriate regional title block and facility title. The Contractor shall provide a revised/final version of the as-built drawings to the Government as part of the site acceptance report (SAR). (CDRL IMP006)

C3.6.2.4 Tools and Test Equipment

The Contractor shall provide all tools, test equipment, and test jigs required to install, test, and maintain the AFSSVS system until it is accepted by the Government.

C3.6.2.5 Electrical Installation and Cabling

The Contractor shall provide and install all cabling, wiring, connectors, and associated hardware within the AFSSVS, between the AFSSVS and the Government provided demarcation point for connection to external equipment and power. This includes Contractor furnished electrical cabling and connectors for all special test equipment. The Contractor shall supply all tools and test equipment necessary to install and checkout the electrical cables. All electrical work shall be accomplished in accordance with NFPA-70, local codes (if applicable), the AFSSVS specification, and FAA-C-1217F.

C3.6.2.6 AFSSVS Site Installation Constraints

The Contractor shall perform all installation activities on a non-interference basis with the site's operations. The Contractor shall make adequate provisions in personnel staffing and procedures to allow for flexible use of the on-site personnel to avoid conflicts with Government activities at the AFSSVS sites. The Government will endeavor to permit Contractor installation and checkout to proceed during normal facility operational hours. However, the Government cannot guarantee that Contractor AFSSVS installation activities will always be accommodated during normal facility operating hours.

While performing installation activities, Contractor personnel shall abide by all Government security requirements in effect at the site.

The Contractor shall participate in a Government in-briefing at each site prior to initiating installation activities. The Contractor shall also participate in a Government out-briefing at the completion of each installation prior to departing from the facility.

C3.6.3 Site Acceptance

The Contractor shall perform a Site Acceptance Test (SAT) to demonstrate that the AFSSVS is operational, functions in accordance with the AFSSVS Specification, and is installed in accordance with the approved site survey worksheets. The AFSSVS system under test shall meet the performance parameters, standards, and tolerances specified in the AFSSVS Specification.

The Government appointed test director/designated representative will witness the SAT.

The Government will determine whether the Contractor shall retest any discrepancies found and not resolved during SAT. (See Section 3.6.3.1 below).

Acceptance of the system by the Government shall occur after successful completion of site acceptance test/retest, and receipt of the final SAT report. (CDRLs TES007, IMP006)

C3.6.3.1 Retest

The Contractor shall fix all AFSSVS failures/discrepancies identified during SAT. The Government reserves the right to determine the scope of retest, i.e., complete SAT retest, partial retest (e.g., testing to demonstrate discrepancies/failures noted during the initial SAT have been resolved/fixed), or to require no SAT retesting.

The Contractor shall document all fixes for the discrepancies/failures discovered during SAT, and retest and validate the fixes. The Contractor shall notify the Government five working days prior to the proposed start of the retest. With the notification, the Contractor shall provide a schedule and the agenda for the test(s) to be performed and copies of the documentation supporting the fixes and any resulting modifications to procedures to the Government.

The retest shall be conducted in accordance with the original procedure, or as modified and approved by the Government. Retest shall be conducted in the presence of the Government-appointed test director/designated representative, who will witness all tests and validate the test results collected. (CDRL: TES002, TES003, TES004, TES005)

C3.6.3.2 Site Acceptance Test Report

The Contractor shall prepare and deliver site acceptance test report documenting the results of the site acceptance test and the performance settings of the AFSSVS equipment to the Government. As attachment to the SAT report the Contractor shall provide a final as-built set of drawings for the site. (CDRL TES007)

C3.7 Integrated Logistics Support (ILS) Program

C3.7.1 ILS Program Requirements

The Contractor shall plan, manage and execute an ILS program in accordance with the requirements contained in this SOW. The objectives of the Contractors ILS program shall be to manage, execute, and integrate support tasks stated in FAA Order 1800.58C with the production, testing, and installation requirements of the AFSSVS.

C3.7.2 ILS Management

The Contractor shall designate an AFSSVS ILS manager to function as the Contractor's ILS interface with the Government on all matters related to the management and execution of AFSSVS logistics and training tasks. The ILS manager shall be responsible to the Contractor's AFSSVS program manager for all ILS related requirements and shall be at a management level commensurate with managers of hardware development, engineering, and engineering specialty disciplines. The ILS manager shall serve as the Contractor's focal point for interface with the Government on all matters relating to the Contractor's AFSSVS ILS program.

C3.7.3 Integrated Support Plan (ISP)

The Contractor shall deliver an Integrated Logistics Support (ISP) plan concurrently with the AFSSVS technical proposal. The ISP shall detail the Contractor's plan for managing the ILS program for the AFSSVS program life cycle. The ISP will include the Contractor's logistics management information (LMI) plan, technical book plan, and training plan.

The Government reserves the right to approve the ISP as submitted with the Contractor's proposal or to require the Contractor to update and resubmit the ISP for Government approval after contract award. The Contractor shall use the Government approved ISP as the controlling document for the Contractor's AFSSVS ILS support program. (CDRL LOG001)

C3.7.4 National Airspace Integrated Logistics Support Management Team (NAILSMT)

The Government will establish a joint Government/Contractor ILS Management Team, referred to as a NAILSMT, to serve as the primary tool for managing, controlling, monitoring, coordinating, assessing, and approving AFSSVS ILS schedules, development, and implementation, prioritizing ILS requirements, and assigning action items.

The Government Associate Product Lead for Logistics (APLL) will serve as the NAILSMT chairperson. The APLL will be responsible for the coordination/scheduling meetings, and preparing the meeting agenda and minutes.

Unless otherwise scheduled by the Government, the NAILSMT will be held in conjunction with AFSSVS Program Management Reviews (PMRs), see Section 3.3.2 above.

C3.7.4.1 NAILSMT Meeting Participation

The Contractor shall support the NAILSMT by submitting agenda items and ensuring participation (e.g., status briefings) of the Contractor/sub-contractor personnel responsible for preparing the ILS deliverables identified in the NAILSMT meeting agenda. The Government will determine whether or not Contractor's sub-contractor participation in scheduled meetings shall be required. (CDRL ADM001)

C3.7.4.2 NAILSMT Administrative Support

The Contractor shall provide administrative support for meetings held at the Contractor's facility. Such support shall consist of, but is not limited to providing meeting/conference room, access to telephones, copy, and facsimile equipment, and clerical support for the recording and preparation of meeting minutes. (CDRL ADM002)

C3.7.5 Logistics Management Information (LMI)

The Contractor shall deliver to the Government the data products contained on the attached LMI Data Products Worksheets in the format attached to CDRL LOG002. The data products shall represent the system design configuration including systems, subsystems, components, assemblies, subassemblies, support and test equipment, and training equipment required by the AFSSVS.

- The Contractor shall provide LMI data to the LRU level for all pure COTS or NDI AFSSVS items.
- The Contractor shall provide LMI data to the component level for all developmental AFSSVS items.
- The Government will determine whether data for modified COTS AFSSVS items will be provided to the LRU or component level.
- Data for temporary items are not required.

The Contractor shall adhere to the data definitions, edits, and data formats as described in Appendix B, MIL-PRF-49506, the attached LMI Data Products worksheets, and the AFSSVS Product Format attachment to CDRL LOG002**.** The Contractor shall develop and deliver a LMI Plan, in Contractor format as an attachment to the ISP (CDRL LOG001). The LMI plan shall detail the Contractor's plan for performing the logistics requirements specified in the AFSSVS contract.

The Contractor shall make maximum use of previously collected and analyze data, and documentation prepared for COT/NDI AFSSVS hardware/components whenever possible.

C3.7.5.1 Level of Repair Analysis (LORA)

The Contractor shall iteratively perform a level of repair analysis (LORA) using the Government provided National Airspace Level of Repair Analysis (NASLORA) Model. The LORA shall evaluate the effect of design or maintenance alternatives on support costs and operational readiness, to access logistic risks, and to assist in translating hardware design into detailed logistics support requirements.

The Contractor shall perform sensitivity analyses and quantitative evaluations to identify and analyze critical life cycle support cost and operational availability parameters. The alternatives or policies evaluated, using the LORA, shall be executed independently and the results analyzed. The Government reserves the right to require sensitivity analysis of other variables not originally considered by the Contractor. The source, maintenance, and recoverability (SMR) characteristics resulting from the LORA shall be used in the development of the LMI.

The Contractor shall summarize the output and the results of the LORA predictions, evaluations, and sensitivity analyses in the LORA report. After Government approval of the LORA, the Contractor shall incorporate the results of the analysis into the LMI report, as well as into all related data items, e.g., technical manuals required by the AFSSVS contract. (CDRL LOG003)

C3.7.5.2 AFSSVS Hardware Breakdown Structure

The contractor shall provide a preliminary AFSSVS top-down hardware breakdown structure to the LRU level as part of the Contractor's technical proposal. The Contractor shall update the breakdown structure during the Government's functional and physical configuration audits (FCA/PCA) and during the Provisioning Conference. After the Provisioning Conference the Contractor shall deliver the final breakdown structure to the Government for approval. (CDRL LOG004)

C3.7.5.3 LMI Data Reviews

As ordered by the Government, the Contractor shall present LMI data for review at design, program, and logistics reviews and meetings.

C3.7.5.4 LMI/Provisioning Guidance Conference

The Contractor shall host and participate with the Government in a Logistics Management Information (LMI)/Provisioning Guidance Conference (PGC) that shall be scheduled in conjunction with the Post Award Conference (see Section 3.3.1, above). The Contractor shall ensure the participation of appropriate Contractor/subcontractor personnel who shall be

responsible for preparing the logistics and training deliverables specified in the AFSSVS contract. (CDRL ADM001, ADM002)

The purpose of the LMI/PGC shall be to ensure Contractor understanding of the logistics requirements specified in the AFSSVS contract including:

- The Contractor's Integrated Support Plan (ISP);
- Provisioning and Provisioning Technical Documentation;
- LMI Analysis;
- LCN structure;
- LMI candidate list;
- Contractor's organization for accomplishing logistics and training requirements;
- Site/depot sparing concept;
- Provisioning Parts List (PPL);
- Engineering Data for Provisioning (EDFP);
- Logistics schedules;
- Technical instruction book (TIB).

C3.7.5.5 Engineering Data for Provisioning (EDFP)

The Contractor shall provide an EDFP (also referred to as Production Engineering Drawing Package), at least equal to MIL-T-31000 and data item description (DID) DI-ILSS-81289. The EDFP shall contain technical information for each LRU designed and manufactured by the contractor and for each NDI LRU used in the AFSSVS. (CDRL LOG005)

The EDFP data package shall include:

- Full production level drawings at least equal to MIL-T-31000, including special process manufacturing and tooling information.
- Plan views, test procedures, test data sheets and repair procedures for each newly developed item and all available COTS or NDI documentation.
- Master patterns on stable base material for all newly developed items.
- Specification control drawings for each NDI and commercial LRU used by the contractor in the subsystems. These drawings shall be sufficient in detail to allow the Government to procure replacement form, fit, and function items for units, which are no longer available in the commercial market. Consideration such as unit configuration, software versions, dip switch setting, jumpers, etc., which are required for the unit manufactured by the contractor to operate correctly in the system, shall be included in the drawings.

C3.7.5.6 Provisioning Conference

The Contractor shall host and support provisioning conferences (PCs) as specified in the LMI Data Products Worksheet. The PC shall be held at the Contractor's facility unless otherwise specified by the Government. The Contractor shall ensure the participation of AFSSVS

knowledgeable Contractor/subcontractor personnel. A PC shall be held not later than 60 days after Government receipt of Increment 1 of the LMI data. Prior to a PC, the Contractor shall deliver the following EDFP data (**non-proprietary only**) to the Government for review.

- Drawings: One complete set, at least equal to MIL-T-31000, of assembly and detail drawings (i.e., commercial drawings and associated lists for NDI and production drawings for developmental equipment) for each item that appears in the Parts Master File (PMF). Common resistors, capacitors, MIL, and JAN components that are readily available from commercial sources as standard items need not be included.
- Master Pattern and Plan View of Parts Layout: The plan view of each parts-mounting side of each circuit board showing all of the parts mounted on that side. Where 90% or more of the parts are all on one side, that side alone may be pictured, if clarity can be maintained, with the parts on the reverse side phantomed or outlined thereon using short dash lines, or, at the option of the Contractor, a separate plan view of the reverse side may be provided. Reference designations shall be shown on or for each part, using call out lines where necessary. The illustration may be a line drawing, a marked photograph, or a combination thereof, at the option of the Contractor.

During the PC, the Contractor:

- Shall make samples of systems, assemblies, and parts listed in the approved PMF available for examination for the duration of the conference.
- Shall furnish technically knowledgeable personnel to disassemble the AFSSVS equipment to the extent required by the Government, and such tools as may be needed for disassembly/reassembly.
- Shall provide facilities, e.g., office space, conference room, access to telephone/facsimile, etc., for the Government provisioning team and Contractor personnel. The number of Government participants in the PC will be provided to the Contractor prior to the conference.
- Shall ensure the participation of Contractor personnel with detailed knowledge of the subject matter they represent, e.g., provisioning, provisioning and technical documentation, hardware/software maintenance, engineering and system design, etc.
- Shall make all AFSSVS EDFP data, **both proprietary and non-proprietary**, available for Government reference as necessary. The Government will not copy or remove any proprietary data from the Contractor's facility.

At any time during the term of the AFSSVS contract or any extension thereof, the Government reserves the right to order additional provisioning conferences and the updates to LMI data that will be required to support the PC. (CDRLs ADM001, ADM002, LOG002, LOG004, LOG005)

C3.7.5.7 Cataloging

The Contractor shall screen through Defense Logistics Service Center (DLSC) for national stock numbers (NSNs) all information entered on the LMI database (Item Identification), in accordance with paragraph 2.210.3, DOD Manual 4100.38M. Screening results shall be

documented in the LMI Data Worksheet Data Table and shall be no more than 60 days old when the LMI data is delivered. With Government approval, the Contractor may use a current PC based parts list/software program for this requirement.

After completing DLSC screening, the Contractor shall provide (contract option) data required by the Government for Item Identification (FED-STD-5) for items not cataloged.

Items identified as proprietary shall be clearly marked and identified as PROPRIETARY. (CDRL LOG006)

C3.7.6 Site Spares

The Contractor shall prepare and deliver to the Government a list of recommended site replaceable spares, assemblies, and consumables for AFSSVS configuration at each site. The list shall be in Contractor format and shall include each LRU noun nomenclature, NSN, part number, manufacturer's CAGE code, and the unit price that will be charge to the Government, mean-time-between-failure (MTBF), and recommended quantity for each LRU. The Government reserves the right to order all, more than, less than, or none of the items and quantities recommended. (CDRL LOG007)

The Contractor shall deliver the site spares ordered by the Government with each AFSSVS. The Contractor shall NOT ship the AFSSVS, site spares, and ancillary equipment, to a site until NSNs have been assigned to all the site spares. The Government reserves the right to waive the NSN requirement on a site-by-site basis.

C3.7.7 Depot Spares

The Contractor shall provide the Government a list of all the recommended AFSSVS depot spares/LRUs and separately priced CLINs for each spare/LRU listed. The list shall be in Contractor format and shall include each item's noun nomenclature, NSN, part number, manufacturer's CAGE code, and the unit price that will be charge to the Government, mean-time-between-failure (MTBF), and recommended quantity for each item. The Government at its sole discretion may procure all, parts, or none of spares/LRUs listed. The Contractor shall package and ship the depot spares in accordance with the AFSSVS contract. (CDRL LOG008)

C3.7.8 NAS System Identification Report

The Contractor shall use the bar code symbology standard, UCC/EAN Code 128, to identify contract assets at the lowest replaceable unit (LRU) level. For each LRU bar coded asset, the Contractor shall provide the following information:

- Manufacturer's part number per LRU
- Manufacturer's serial number per LRU
- LRU circuitry revision level

- LRU software release level
- LRU repair, maintenance, and revision data
- Ancillary equipment items

The contractor shall also provided system-level data such as:

- Major system components or enclosures
- Component/enclosure descriptive data
- System configuration
- Any other associated data

LRU's may consist of circuit boards, modules, cable assemblies, power supplies, etc. Ancillary equipment may consist of personal computer data terminals, displays, test rigs, etc. System components or enclosures may consist of cabinets, mounting assembly's etc.

The Contractor shall utilize the FAA's Bar Code Asset Tracking System (BCATS) data base or equivalent COTS package to mange the contract asset detail data for each category of asset from point of acquisition to production and delivery.

The Contract shall generate a report that contains a listing of all assets that have been identified with a bar code label. The report shall include all of the data elements considered for bar coding as specified in the Data Item Description (DID). The Contractor shall prepare a NAS System Identification Report IAW the DID (FAA-BCATS-96-001), Bar Code Asset Serial Number Symbology, Quality and format Specification-FAA-BCATS-96-002, V 1.0. (CDRL LOG009).

C3.7.9 Support and Test Equipment

The Contractor shall prepare and deliver to the Government a list of all the tools and test equipment (T&TE), both common and special, that are not an integral part of the AFSSVS but are required to inspect, test, calibrate, service, and repair the AFSSVS. This list shall include only the tools and test equipment required to perform authorized site maintenance tasks. The list shall be in Contractor format, include a section for all common and a section for all special T&TE, and provide a detailed description of each tool and test equipment, the tool/test equipment part number, the quantity required at each site, and the manufacturer and manufacturer’s CAGE code. The Contractor shall ensure that the T&TE data on the list agrees with the T&TE information contain in AFSSVS technical documentation, e.g., the technical instruction book. (CDRL LOG010)

C3.7.9.1 Common Tools and Test Equipment

The Government will provide the common tools and test equipment required by each site to support the AFSSVS.

C3.7.9.2 Special Tools and Test Equipment

The Contractor shall minimize the requirement for special tools and test equipment (STTE). STTE is defined as items having single or peculiar application, are not commercially available, and are specifically built to service, test, adjust, and maintain specific AFSSVS components and subsystems.

The Contractor shall deliver with the site's AFSSVS equipment a complete set of STTE required for site maintenance including: test cables, connectors, extender kits, adapters, software, documentation, and all other items required to permit use of the special test equipment with AFSSVS hardware, firmware, and software.

C3.7.10 Manuals, User's Guides, and Technical Instruction Books

The Contractor shall provide a copy of all the COTS/NDI documentation normally issued by the original equipment manufacturer (OEM) with their hardware, e.g., operator's manual user's guides for personal computers, etc. The Contractor shall prepare and deliver to the Government a list of all the COTS/NDI operator manual(s), user's guide(s), and maintenance manual(s) that will be delivered with the AFSSVS**.** This list will be in Contractor format and include the document/manual title, date of publication, originator (i.e., Contractor or other OEM) of the manual/document. The Contractor shall deliver a preliminary list and one set of the COTS/NDI guide(s)/manual(s) with their technical proposal. (CDRL DOC001)

Additionally, the Contractor shall prepare and deliver operator's manual(s), user's guide(s), and maintenance manuals (referred to by the Government as instruction books (developed or modified) for the AFSSVS. The Government will review and approve manuals prepared by the Contractor as the OEM for AFSSVS equipment. The Government will either accept the Contractor's manuals as delivered or required the Contractor to modify or prepare guides/manuals.

One set of the approved Contractor manuals and of other OEM operator's manuals, user's guides, and maintenance manuals shall be delivered with each AFSSVS. There shall be no restriction on reproduction or use of the delivered Contractor/other OEM documentation or the information contained therein.

C3.7.10.1 Operator's Manual(s)

The Contractor shall deliver operator's manual(s) that when used by trained Government specialists will enable the specialist to operate and use the hardware, firmware, and software provided under the AFSSVS contract. (CDRL DCO002)

C3.7.10.2 System User's Guide

The Contractor shall deliver a system user's guide that describes the AFSSVS architecture, all of the AFSSVS hardware and software components, how they are integrated. (CDRL DCO003).

C3.7.10.3 System Administrators Handbook

The Contractor shall deliver a system administrator's handbook that will assist a system's administrator in performing AFSSVS system administration functions. (CDRL DOC004)

C3.7.10.4 Firmware Support Manual (FSM)

The Contractor shall deliver a firmware support manual that provides the information necessary for a trained specialist to program and reprogram firmware devices that are used to store unique AFSS site configuration data. (CDRL DOC005)

C3.7.10.5 Technical Instruction Book (TIB)

The Contractor shall deliver a technical book plan (TBP) as an attachment to the Contractor's ISP (CDRL LOG001). The TBP shall be in Contractor format and shall describe the Contractor's plan for satisfying the TIB (maintenance manual) requirements described below.

The Contractor shall deliver a technical instruction book (TIB) that includes data and commercial drawings on all COTS/NDI and custom items/subsystems (e.g., memory, input/output element, interface adapter, power supplies, and each type of computer-oriented peripheral equipment) used in the AFSSVS and shall include instructions describing the installation, operation, and site maintenance of all the hardware, firmware, and software provided under this contract. These instructions shall be of sufficient detail to allow a trained maintenance technician to perform the required maintenance tasks.

The TIB shall include a level of detail on the hardware, firmware, and software and their interaction to provide trained Government maintenance specialist a thorough understanding of all AFSSVS functions. The organization, content, and level of detail of the TIB shall be such that AFSSVS problems and problems concerning interfaces with external systems and devices, can be diagnosed and corrected by trained Government maintenance specialist. All drawings and associated lists shall provide sufficient information to permit Government maintenance, modification, and engineering analysis of any commercially developed item.

The TIB shall be divided into two volumes, Volumes I and II.

a. Volume I shall contain the detailed maintenance and checkout procedures required to enable trained Government maintenance specialists to perform all site preventive and corrective maintenance tasks, to identify hardware, software, or firmware line replaceable unit (LRU) failures, and to safely replace the faulty LRU. Volume I shall be a standalone document and shall be distributed to the AFSSVS site level. The Contractor shall deliver

two copies of the approved Volume I with each system. Volume I shall be completed at least in Government approved draft to support SAT at the first operational AFSSVS site. (CDRL DOC006)

b. Volume II shall contain the level of detail required by trained Government system's engineers/specialists to isolate system failures to the hardware component, software module, or firmware component level. Volume II will be used in conjunction with Volume I and should replicate only essential information from Volume I needed to support the continuity of the component level discussion. (CDRL DOC007)

The Contractor shall deliver Volumes I & II without restriction on reproduction or use of any information contained therein. The Contractor shall deliver the TIB in hard copy and CD-ROM format, in accordance with the CDRL. (CDRLsDOC006, DOC007)

C3.7.11 Maintenance Concept

The AFSSVS shall be supported by two levels of maintenance: site and depot, in accordance with FAA Order 6000.30B, *Policy for Maintenance of the NAS through the Year 2000.* This concept assumes the use of modular designed equipment, which enables site level personnel to correct equipment failures on-site by replacing the faulty line replaceable unit (LRU).

C3.7.11.1 Site Level Maintenance

Site maintenance will consist of all the maintenance activities performed on equipment while it is installed in its operating environment and includes both corrective and preventive maintenance actions, the installation of authorized/approved electronic equipment modifications (EEMs), and the services associated with equipment certification. Government AFSSVS airway transportation system specialist (ATSS) will perform fault isolation to the line replaceable unit (LRU) level using built-in diagnostics equipment, e.g., built-in test/built-in test equipment (BIT/BITE), and will restore service by replacing the faulty LRU with a serviceable site spare.

The Contractor shall be responsible for maintenance at an AFSSVS site until the completion of site acceptance test (SAT) and acceptance by the Government.

C3.7.11.2 Contractor Repair Service (CRS)/Depot Level Maintenance

The Contractor shall furnish contractor repair service (CRS)/depot level maintenance in accordance with the provisions of this section for AFSSVS repairable items and components. A repairable item and component is defined as a module, printed circuit card, or line replaceable unit (LRU).

CRS shall begin one year after the Government accepts the first operational AFSSVS site. At that time, the Contractor shall have the capability and expertise necessary to repair all AFSSVS repairable items and components.

Under the CRS concept, the FAA Logistics Center (FAALC) will manage the depot repair program and store exchange and repair (E&R) spares to support AFSSVS sites. AFSSVS sites will work directly with the FAALC; FAALC will interact with the Contractor for all CRS requirements.

The Contractor shall furnish all qualified labor, supervision, materials, equipment, tools, appliances, and services to repair components of the AFSSVS equipment. All equipment ordered under CRS/depot repair shall be ordered as normal repair. The Contractor shall provide for expedited and emergency repair services on a per occurrence basis. CRS/depot maintenance items returned to the Contractor depot for repair shall be categorized by the Government as **normal**, **expedited**, or **emergency** repair:

a. **Emergency** repair of failed item(s). The Contractor shall have all repair actions completed **within 24 hours** after receipt of the item(s) by the Contractor. The Contractor shall return the repaired item(s) within 48 hours after receipt to the site from which the item(s) was received or to the FAALC, as directed by the Government.

b. **Expedited** repair of failed item(s). The Contractor shall have all repair actions completed within **three (3) working days** after receipt of the item(s) by the Contractor. The Contractor shall return the repaired item(s) within five (5) working days after receipt to the site from which the item(s) was received or to the FAALC, as directed by the Government.

c. **Normal** repair of failed item(s). The Contractor shall have all repair actions completed within **14 calendar days** after receipt of the item(s) by the Contractor. The Contractor shall return the repaired item(s) within 17 calendar days after receipt to the site from which the item(s) was received or to the FAALC, as directed by the Government.

Repairable items and components will be shipped prepaid to the Contractor for repair from either the FAALC or direct from AFSSVS sites. The FAALC AFSSVS Item Manager will furnish shipping instructions for repaired items. The Contractor's return of repaired items and components shall be free on board (FOB) destination. The Contractor shall return the repaired item(s) via the most expeditious means available, i.e., over-night mail, Federal Express (FEDEX, or United Parcel Service (UPS).

LRUs shall be repaired to restore them to a serviceable operating condition and shall meet the performance requirements of the AFSSVS specification.

1) Contractor repair procedures shall include the following: (i) cleaning, visual inspection, bench tests, and fault isolation; (ii) disassembly as necessary to identify and accomplish required repairs or to establish the item as serviceable; (iii) reassembly, calibration, functionality testing, acceptance inspection, and preparation

for shipment. All repaired LRUs shall successfully undergo a system level test prior to being returned to Government.

2) When the Contractor determines that an item cannot be repaired, the Contractor shall promptly notify the Contracting Officer and submit rationale for that determination.

   If the Contracting Officer agrees that an item cannot be repaired, the Contractor shall ship a new identical item to the site from which the item was received or to the FAALC. This new identical item shall be compatible with all current interfacing components of the AFSS system and shall meet the current performance requirements of the AFSSVS specification. The Contractor shall bill the cost of the new item to the CRS replacement CLIN using the current CLIN pricing for the item in the contract as instructed in writing by the Contracting Officer.

3) All repairs shall be in accordance with the Contractor's established shop methods and procedures developed for the AFSSVS System. Testing, inspection and final acceptance of repaired items shall be in accordance with the production test, inspection, and acceptance requirements contained in the AFSSVS Specification and this SOW.

4) The Contractor shall complete any Government approved modification to items required by the contract and not previously accomplished at the time of repair. Each modified item or LRU shall meet form, fit, and function of the item that it replaces and be two-way interchangeable, i.e., unmodified items shall operate in place of modified items and modified items shall operate in place of unmodified items.

5) The Contractor shall be responsible for the initial lay-in of piece parts and for obtaining replenishment units and spare piece parts required for use in the repair of failed items. These parts shall remain the property of the Contractor until incorporated into the repaired items at which time they become Government property. All parts removed during repair become the property of the Contractor.

C3.7.12 Contractor Engineering/Technical/Maintenance Support Services

As ordered by the Government, the Contractor shall provide technical personnel and the necessary materials to perform a variety of tasks at the Contractor's plant, field sites, or other locations as directed by the Government (CLINs 0017, 1012, …). The tasks shall include but are not limited to:

a. Providing assistance during the cutover to operational service of any system;
b. Conducting special training which the Contractor is qualified to provide;
c. Moving, modifying, and relocating equipment at field sites (Reference SOW C3.6.2.1 also);
d. Providing technical personnel and support during meetings at field sites and other Government designated locations;

e. Repairing LRUs that were damaged by other than routine failure occurrences, e.g., lightning strikes, technician error, water damage, etc., to serviceable operating condition.
f. Providing on site technical support to include but not limited to interface testing and software functional testing to the Government during Government testing;
g. Providing on site troubleshooting of system failures or performance and/or functional anomalies;
h. Manufacturing and delivering minor hardware elements of the system to the Government.

The Contractor's personnel provided shall have experience on the Contractor's AFSSVS system and shall have knowledge of the system's hardware, software, firmware and functional and performance features sufficient to perform the assigned task (s).

The personnel and the materials needed to perform the task(s) shall be available at the locations specified by the Government within 24 hours of notification.

These services shall be exclusive of those provided under the remainder of this contract.

The Contractor shall prepare and deliver a letter type trip report after each support services task is completed.

C3.7.12.1 Pre-Acceptance Maintenance Support

The Contractor shall be responsible for all AFSSVS maintenance, including spares and test equipment, at each site until Government accepts the site.

C3.7.12.2 Post-Acceptance Technical Assistance/On-Site Support

After site acceptance the Contractor shall provide technical assistance to Government personnel for the maintenance of AFSSVS hardware, firmware, and software. Technical assistance shall consists of the following:

a. Establishment of a 24-hour, 7-days-a-week (24x7), toll-free telephone advisory service through which AFSSVS technical experts (i.e., systems engineer(s), computer programmer(s)/technician(s), hardware maintenance technician(s)) with experience on the Government's AFSSVS hardware, firmware, and software are available to provide assistance to the Government in resolving AFSSVS problems. Assistance from the Contractor shall be available by telephone within two hours after a request is received from the Government.

b. Establishment of an on-site support capability through which fully qualified Contractor AFSSVS engineers/computer/software technicians/maintenance technicians are available to provide on-site repair and technical assistance within 24 hours, including weekends and holiday periods, after receipt of a request from the Government.

The Contractor shall provide personnel who have AFSSVS experience in the following specific areas:

a. Use, capabilities, and limitations of the supplied operating system;
b. Use, capabilities, and limitations of the software development tools;
c. Interactions between the software development tools and the supplied operating system;
d. Accessing failure report information from application software;
e. Utilizing the communications capabilities of the supplied hardware and software;
f. AFSSVS hardware design; and,
g. AFSSVS software design.

C3.7.12.3 AFSSVS Warranty

The Contractor shall provide a 12-months warranty beginning with Government site acceptance at each AFSSVS location for all hardware, software, and ancillary equipment delivered in accordance with the AFSSVS contract. During the warranty period, the Contractor shall repair, at no cost to the Government, all hardware, software, and firmware components that fail. The warranty period shall apply separately to each AFSSVS site, i.e., the warranty period for a site shall begin with Government site acceptance.

The Contractor shall serve as the Government's single point of contract for repair work that is covered under any and all warranties (i.e., OEM pass through warranty(s), AFSSVS Contractor warranties) provided with the AFSSVS hardware and software.

The Contractor shall establish and staff a toll-free telephone warranty response service through which replacement parts can be ordered by the Contracting Officer or designated representative. The warranty response service shall be available 24 hours a day, 7 days week, including holidays. The Contractor shall ship replacement LRU(s) so that it is received at the site within 24 hours after the Contractor receives the telephone request from the Government.

The Contractor shall maintain a record of all hardware and software warranty failures/claims received from the Government. The Contractor shall prepare and deliver a warranty failures/claims report to the Government, beginning 30 days after Government acceptance of the first operational AFSSVS site. The warranty failures/claims report shall be in Government approved Contractor format, shall have a hardware and a software section, and shall be submitted monthly.

The hardware section of the report shall include the site location, the LRU noun nomenclature, national stock number (NSN), part number (PN), serial number, date and description of the fault reported by the site, date the LRU was received by the Contractor, date the Contractor completed repair of the LRU, and a description of the repair(s) performed by the Contractor. All LRUs awaiting repair will be carried forward until they have been reported as having been repaired.

The software section shall include the site location, date and description of the fault reported by the site, date the Contractor complete the repair, and a description of the repair(s) performed by the Contractor.

The report shall include a trend analysis to identify frequently failing hardware components and software; and planned fixes to improve the reliability/mean-time-between-failure of the hardware/software. (CDRL LOG011)

C3.7.12.4 Reports

The Contractor shall maintain a record of all hardware and software failures, for both warranty and out-of-warranty actions, received from the Government and provide the following reports

a. Failure Summary and Analysis Report
The Contractor shall prepare and deliver a monthly failure summary and analysis report to the Government, beginning 30 days after the Government accepts the first operational AFSSVS site. The report shall be in Government approved Contractor format and shall have a minimum of two sections:

I. Warranty Section
   a. Hardware
   b. Software

II. Out-of Warranty Section
   a. Hardware
   b. Software

The hardware section of the report shall include the site name/location, the LRU noun nomenclature, national stock number (NSN), part number (PN), serial number (SN), date and description of the fault reported by the site, date the LRU was received by the Contractor, date the Contractor completed repair of the LRU, and a description of the repair(s) performed by the Contractor. All LRUs awaiting repair will be carried forward until they have been reported as having been repaired.

The software section shall include the site name/location, date and description of the fault reported by the site, date the Contractor completed the repair, and a description of the repair(s) performed by the Contractor.

The report shall include a trend analysis to identify frequently failing hardware components and software; and planned fixes to improve the reliability/mean-time-between-failure of the hardware/software**.** (CDRL LOG011)

b. Failure Reporting Analysis and Corrective Action System (FRACAS)
The Contractor shall develop a Failure Reporting Analysis and Corrective Action System (FRACAS) program. The Contractor shall collect failure, recovery, and maintenance data in accordance with MIL-STD-470, Task 470, and MIL-STD-785, Task 104. The Contractor shall analyze the FRACAS data to estimate AFSSVS reliability and maintainability (R&M) values, determine AFSSVS R&M trends, measure reliability growth, identify failure modes,

calculate relative frequencies of failure modes, and develop corrective action for the reporting period. The Government will specify the reporting period for the first quarterly and subsequent reports in the delivery order. (CDRL LOG012)

C3.7.12.5 Escrow Account

The Contractor shall establish and maintain-a third party escrow account containing a complete set of the technical documentation, including proprietary information, for the AFSSVS system. Changes approved under the Contractor' configuration management program, shall be applied to the data in escrow. The escrow account shall include the following data:

a. Product drawings and associated lists at least equivalent to MIL-T-31000 (i.e., commercial drawings and associated lists for NDI and production drawings for developmental equipment);
b. Special inspection equipment drawings and associated lists;
c. Special inspection equipment operating instructions;
d. Special inspection equipment calibration procedures;
e. Special tooling drawings and associated lists.
f. Software procedures and products.

The Contractor shall deliver an index of all the technical data contained in the escrow account. The Contractor shall maintain the index and deliver an updated index to the Government at the end of each month during which changes have been posted. (CDRL ESC001)

The Contractor shall document in a escrow account data package validation report that the data in the escrow account and elements thereof conform to the contractual requirements, and accurately depict the hardware developed, produced and modified under the contract. Contractor uses of the data in the escrow to produce, inspect, and test the AFSSVS hardware is considered acceptable evidence that the validation requirement has been met. (CDRL ESC002)

The Contractor shall make the data in escrow available for periodic Government review and inspection. The Contractor shall support the Government’s reviews and inspections. (CDRL ADM001, ADM002)

The Contractor shall provide a source for the repair, service, and replacement of the hardware and components used in the AFSSVS for the AFSSVS life cycle. If the Contractor fails to provide support of the AFSSVS, the Contractor shall agree to the complete and unconditional release of the data in escrow at the price established in this contract.

C3.8 Training

C3.8.1 Contractor’s Proposal for Training

The Contractor shall submit a Proposal for Training along with the Contractor's AFSSVS Technical Proposal. For each AFSSVS course, the Contractor shall identify the course format, course content, course synopsis, and proposed course length in the training proposal. (CDRL TNG001)

The Contractor's Proposal for Training shall include the following deliverables:

a. Contractor Personnel Qualification Report (PQR)

   The Contractor shall include a personnel qualification report (PQR) for personnel involved in developing and providing AFSSVS training. The Contractor shall certify that personnel responsible for developing the training modules are knowledgeable about and qualified to operate or maintain the AFSSVS equipment.

   Contractor personnel responsible for developing maintenance training shall have knowledge of basic electricity and electronics, understand basic transmission and signaling, be able to read and use functional and flow diagrams and use the tools and test equipment required to perform site maintenance on AFSSVS equipment.

   For each Contractor nominated instructor, the PQR shall include information on the nominee's instructor background and qualification, and a description of the course(s) taught, course(s) length, and number of times the course(s) were taught**.** (CDRL TNG002)

b. Task and Skills Analysis (TASA) Report

   The Contractor shall provide a preliminary TASA report that identifies the impact the introduction of the AFSSVS equipment and technology will have on the current work force and identifies the operator and maintenance skills required to operate and maintain the AFSSVS. (CDRL TNG003)

C3.8.2 Training Guidance Conference

After contract award, the Contractor shall host a training guidance conference (TGC). The TGC shall be schedule to occur in conjunction with the AFSSVS Post Award (section 3.3.1 above) and LMI/Provisioning Guidance (section 3.8.5.4 above) Conferences. The purpose of the TGC shall be to review in detail all the training documentation provided with the Contractor's technical proposal (e.g., Contractor's Training Proposal, PQR, etc) against the Government's AFSSVS training requirements, to provide the Contractor the opportunity to obtain clarification of the requirements, and to ensure the Contractor's Training Proposal accurately reflects the Government's requirements. After the TGC, the Contractor shall update their Training Proposal and the associated deliverables described in Section C3.8.1 above and resubmit the Training Plan for Government approval. (CDRL TNG001)**.** The approved Contractor's Training Plan shall become an appendix to the Contractor's ISP. (CDRL LOG001)

The Contractor shall ensure participation of the personnel that will be responsible for the preparation of the training deliverables. The Contractor shall prepare the agenda and the minutes for the TGC. (CDRLs ADM001, ADM002)

C3.8.3 Training Requirements

Unless otherwise specified in this contract, the Contractor shall prepare and deliver the training services and processes in accordance with the FAA-STD-028C requirements specified in this contract. The Contractor shall revise and maintain course management materials, curriculum materials, and courseware until delivery of the First Course Conduct and Validation Report, where appropriate.

The Contractor shall provide the AFSSVS training courses described below.

C3.8.3.1 AFSSVS Orientation Course

This course shall provide an overview of the AFSSVS system, a detailed orientation on AFSSVS functionality, operator and maintenance personnel responsibilities, and the Government support required by the Contractor during and AFSSVS site survey, installation, and testing. This training is intended for personnel concerned with monitoring the AFFSSVS installation and participating in site acceptance test (SAT), e.g., Government Technical Onsite Representatives (TORs), Regional Facilities and Equipment (F&E) personnel, and AFSSVS site personnel.

a. The Contractor shall prepare this course in Government approved contractor format. The Contractor shall conduct this training at the Contractor's facility and at designated Government locations.

b. Course prerequisites: None.

C3.8.3.2 AFSSVS OT&E Hardware Familiarization Course

This course shall provide instruction on AFSSVS capabilities, limitations, functionality and test procedures, and provide hands-on AFSSVS training for Government operator and maintenance personnel who will be participating in operational testing on the first article system at the WJHTC.

a. The Contractor shall prepare this course in Government approved contractor format. The Contractor shall conduct this training after the installation of the first article system.

b. Course prerequisite: Students will be Government trained/qualified voice switching system AT operators/specialists or AF maintenance specialist.

C3.8.3.3 AFSSVS Air Traffic Operator/Specialist Course.

This course shall provide detailed instruction, including hands-on training, on the operation and functions of the AFSSVS equipment. This training will be a conventional "train-the-trainer" course for Government AT cadre and instructor personnel who will be responsible for training the Government AT AFSSVS specialists. However, the final deliverable will be a computer based instruction (CBI) course that will teach touch entry device (TED) functionality followed by hands-on training using the site-specific TED equipment in the configuration that will be used at the facility. The site-specific training will be unique to each site and the CBI training must be delivered in a form that can be modified/configured by each site to meet their specific needs.

a. The Contractor shall deliver this course in accordance with FAA-STD-028C. The Contractor shall conduct this training at the Contractor's facility and at Government designated locations.

b. Course prerequisites: Students will be Government trained/certified air traffic operators/specialists.

C3.8.3.4 AFSSVS Air Traffic Supervisor/System Administrator Course

This course shall provide detailed instruction, including hands-on training, on the AFSSVS reconfiguration capabilities. This training is initially intended as a "train-the-trainer" course for Government AT cadre and instructor personnel who will be responsible for training the Government AT AFSSVS supervisors.

a. The Contractor shall deliver this course in accordance with FAA-STD-028C. The Contractor shall conduct this training at the Contractor's facility and at Government designated locations.

b. Course prerequisites: Students will be Government trained/certified air traffic supervisors, support specialists, or controllers-in-charge (CIC) and have completed the specialist training.

C3.8.3.5 AFSSVS Hardware Maintenance Course

This course shall provide detailed technical instructions, including hands-on training for Government maintenance specialists who will be responsible for performing site maintenance on the AFSSVS.

a. The Contractor shall deliver this course in accordance with FAA-STD-028C. The Contractor shall conduct this training at the Contractor's facility and at Government designated locations.

b. Course prerequisite: Students will be electronics technicians with:
   - Experience in the repair of communications switching equipment and a basic knowledge and understanding of voice switching system operation and maintenance;
   - Background in digital logic, have completed training in the fundamentals of data communications, microprocessors, computer hardware and software, or have demonstrated proficiency through equivalent training.

The contractor shall deliver to the Government a set(s) of faultable circuit card assemblies (CCAs) for use in AFSSVS Hardware Maintenance training. The CCAs shall be in sufficient quantity and types to enable the instructor to induce a wide range of typical failures into the AFSSVS system to exercise troubleshooting procedures and fault diagnosis/identification by the student. The CCAs may have the capability to induce either individual or multiple faults by connecting/disconnecting jumpers, switches, or other devices as deemed appropriate.

The Contractor shall provide a list of all the faultable CCAs. The list shall include the CCA part number or other identification, quantity of each CCA provided, and an identification of the fault(s) each CCA is designed to induce. The Contractor shall also affix the part number or other identification to each CCA. When properly installed in the AFSSVS, the student shall not be able to identify the pre-faulted CCA until it is removed. (CDRL FAS003)

C3.8.3.6 Engineering Support Services (ESS) Familiarization

This course shall provide detailed technical instructions, including hands-on training for Government system's engineering personnel responsible for AFSSVS second level hardware and software support.

a. The Contractor shall prepare this course in Government approved contractor format. The Contractor shall conduct this training at the Contractor's facility or at a Government designated location.

b. Course prerequisite: Students will be trained electronics engineers/specialists capable of:
   - Isolating system failures to the hardware component, software module, or firmware component level.
   - Programming software;
   - Identifying and testing hardware and software modifications;
   - Have completed the AFSSVS Hardware Maintenance Course.

C3.8.3.7 Information System Security (ISS) Course

This course shall provide detailed technical instructions, including hands-on training, on the system security aspects of the AFSSVS equipment. This training shall be provided in two parts. Part 1 shall be a "train-the-trainer" course for Government AT cadre and instructor personnel

who will train Government AT AFSSVS specialists. Part 2 shall be for Government AFSS supervisory personnel and for maintenance specialist responsible for AFSSVS site maintenance.

a. The Contractor shall prepare this course in Government approved contractor format. The Contractor shall conduct this training at the Contractor's facility and at Government designated locations.

b. Course prerequisite: Students will be Government trained and qualified voice-switching system AT operators/specialists and AF maintenance specialists.

C3.8.4 Course Outcome Requirements

The Contractor shall deliver AFSSVS courses with the following minimum course outcomes.

C3.8.4.1 AFSSVS Orientation Course

Upon successful completion of this training, the student will at a minimum, have knowledge of:

a. The AFSSVS capabilities and limitations;
b. The Contractor's plan and schedule for installation and testing;
c. General understanding of the roles and responsibilities of all TORs, F&E, AT and AF personnel involved in the installation, testing, operation, and maintenance of the AFSSVS;
d. Government support needed by the Contractor during AFSSVS installation and testing.

C3.8.4.2 AFSSVS OT&E System Familiarization Course

Upon successful completion of this training, the student will at a minimum:

a. Be knowledgeable about the AFSSVS capabilities and limitations;
b. With limited Contractor assistance have the ability to operate the AFSSVS and perform the operator and maintenance procedures/tasks required by the test plan.

C3.8.4.3 AFSSVS AT Operator/Specialists Course

Upon successful completion of this training, the student will at a minimum, be able to perform the following functions:

a. Operate the AFSSVS position equipment to perform air-to-ground (A/G) and ground-to-ground (G/G) communications;
b. Perform position specific reconfigurations to accept functionality from another position.

C3.8.4.4 AFSSVS AT Supervisor/System Administrator Course

Upon successful completion of this training, the student will at a minimum, be able to perform the following functions:

a. Reconfigure the AFSSVS positions to meet specific operational needs.
b. Create configuration maps for specific operational requirements.
c. Edit existing maps to meet changing operational needs.

C3.8.4.5 AFSSVS Hardware Maintenance Course

Upon successful completion of this training, the student shall at a minimum, be able to safely perform site maintenance functions listed below on the AFSSVS using the information contained in the technical instruction book (TIB):

a. Operate and maintain the AFSSVS;
b. Perform all periodic maintenance tasks;
c. Use the functional and flow diagrams, test equipment and the AFSSVS built-in diagnostic/test capability to localize faults to the LRU level;
d. Perform required adjustments and restore the equipment performance to specified parameters.

C3.8.4.6 AFSSVS Engineering Support Services (ESS) Familiarization

Upon successful completion of this training, in addition to the knowledge acquired via the AFSSVS Hardware Maintenance course, the student will have a detailed understanding of the AFSSVS theory of operation and be able to perform the following functions:

a. Troubleshoot and repair all malfunctions in the system using diagnostic aids and other standard troubleshooting methods associated with digital and analog circuits;
b. Describe the functional operation of the AFSSVS including all system inputs and outputs; and describe the operational characteristics of the AFSSVS hardware;
c. Identify functionality of the system at the component level and describe input and output parameters for each LRU;
d. Utilize the procedures for modifying unique site configuration parameters;
e. Modify, debug, and execute diagnostics and error reporting modules as applicable.
f. Analyze error and configuration messages as applicable;
g. Identify, install, utilize, and apply approved modification to the software used in the AFSSVS system.

C3.8.4.7 Information Systems Security (ISS) Course

Upon successful completion of this training, AFSS supervisory personnel and AT/AF specialists will be able to accomplish all the security objectives stated in the Protection Profile as applicable to their area of responsibility.

C3.8.5 Course Materials and Documentation

C3.8.5.1 COTS/NDI Training Materials

The Contractor shall use available AFSSVS COTS/NDI training course materials and documentation if the materials and documentation:

a. Satisfy the general course outcomes (section 3.8.4 above);
b. Are approved by the Government;
c. Contain the following minimum requirements for each course.
   - Instructor's guide with a table of contents, a summary of the course, including the lessons in the course, the terminal objectives, course outcomes, the estimated time for each lesson, a listing of the reference materials and equipment required, and associated lesson handouts or support materials, e.g., viewgraphs;
   - Lesson plan(s);
   - Performance component(s) to allow the student to practice the skills being taught;
   - Post-tests with both a written (student achievement) component and a performance component.
   - A quick reference glossary that contains all of the acronyms used in the training materials/course.

(CDRL: TNG005, TNG006, TNG007, TNG009)

C3.8.5.2 Developmental Training Materials

Any training that must be developed shall be developed in accordance with the FAA-STD-028B requirements specified in this contract. Unless otherwise directed by the Government, the Contractor shall follow the FAA-STD-028B procedures and shall submit the materials to the Government for approval. The Government reserves the right to waive any or all of the documentation identified for each course.

a. Task and Skills Analysis; (CDRL TNG003)
b. Training Development Plan; (CDRL TNG004)
c. Course Design Guide; (CDRL TNG005)
d. Test; (CDRL TNG006)
e. Classroom Training; (CDRL TNG007)
f. Computer Based Instruction; (CDRL TNG010)

C3.8.5.3 Authorization to Reproduce Copyrighted Materials

The Contractor shall deliver AFSSVS training materials, i.e., COTS, NDI, and the materials developed for the AFSSVS, free from encumbrances (including copyrighted and registered documentation, and software licenses) that prohibit the Government from reproducing or using the materials for Government AFSSVS training and other requirements. The Contractor shall provide a letter of release for copyrighted, registered, and licensed materials that authorizes the Government to reproduce all of the materials/documentation provided under the AFSSVS contract for Government training. (CDRL TNG015)

C3.8.6 AFSSVS Computer Based Instruction (CBI)

The Contractor shall deliver the CBI courseware in digital video disk (DVD) or CD ROM media which shall present interactive instruction and testing of AFSSVS hardware, software and functional characteristics associated with operator or system administrator (if appropriate) position on the computer display. Instructions that describe the CBI courseware and its use shall be furnished with the software as a test file on the DVD/CD. The software DVD/CD ROM shall contain the source code and executable program. The software shall be provided to the Government without copyright restrictions and shall be reproducible by the Government.

The CBI courseware shall be divided into two distinct modules, i.e., AT specialist module and supervisor/system administrator module.

C3.8.6.1 CBI Software Requirement

CBI lessons shall be developed using as a minimum DOS 5.0, Windows 98, and Authorware 3.0 software, utilize Government furnished templates, be *common management information* (CMI) compliant, and be submitted to the Government for review and approval in accordance with the following FAA-STD-028C requirement.

- Computer Based Instruction CDRL TNG008

Upon vendor request, the Government will furnish the source code for existing CBI courses that teach TED operator functions and supervisor/system administrator functions. This source code may be modified by the vendor to meet the AFSSVS training needs. The Government must approve all revisions and modification.

The Contractor shall not deviate from the using the templates without the expressed written consent from the Government.

C3.8.6.2 CBI Hardware Requirements

The CBI courseware will be presented on DVD or CD-ROM media. It will operate on the FAA Computer-Based Instruction (CBI) platform. At a minimum, these platforms consist of a pentium/500 computer equipped with 128 megabytes (MB) random access memory (RAM), DVD player, speakers, and sound card. After the Government approves the CBI, both the source

code and executable program shall be provided to the Government. The software shall be provided without restrictions and will be reproducible and modifiable by the Government.

C3.8.6.3 CBI Interactive Use

The CBI software shall allow a student to perform the functionality of the TED. Site-specific data such as, radio frequencies and location of direct access lines will be included in the site-specific conventional hands-on training. Creating and editing Position maps, global maps and other configurations such as the ability to 'off-load' frequencies to another facility and to change/move frequencies and direct access (DA) keys to different locations within the pages shall be included in the supervisor training.

C3.8.6.4 CBI AT Specialist Courseware

Specialist courseware shall permit the student via computer keyboard manipulation or mouse activation, as appropriate, to selectively display on the computer monitor typical operator position equipment and to operate the controls displayed on the screen. The software shall respond to student control adjustments by simulating expected equipment responses, e.g., microphone activation, audible responses, visual displays, etc. The Specialist courseware will be a prerequisite for supervisor/system administrator training. The Specialist course shall include:

a. An overall description (Overview block) of the display and how the indicators are to be interpreted. A section instructing the movement between pages on the display and the use of the summary page(s). A section instructing the significance of each section of the display (i.e., radio, direct access, and special function keys). Each key would then be described in detail to include:

    1) Frequency keys – As depicted in the Operator's manual, a clock of the instruction on the meaning of the audio selection ICONS.

    2) Direct Access keys – A description of the Audio Routing Keys and their interrelated indications on the frequency keys as displayed in the Operator's manual. A similar discussion of the Direct Access Keys to include locking and non-locking applications and the visual indications that would be displayed. An instruction on use of the blank overflow column located in the Special Use section of the display.

    3) Special Use Keys – An instructional block covering the indications and use of the special function keys to include the IA, CA REL, RCN ENAB, FREQ FWD, DA, and ERAD PTT as a minimum.

b. A block of instruction on the adjustment and controls located on the speaker module and TED.

c. A block of instruction on the operational applications of the system to include:

    1) Position opening and self test (confidence test);

2) Radio operation/indications;
3) Radio preemption authorities;
4) Direct access phone call;
5) Indirect access phone call;
6) Call conference & transfer;
7) Jack modules;
8) Position shutdown.

C3.8.6.5 CBI AT Supervisor/System Administration (SA) Courseware

The System Administration (SA) courseware shall build on the training provided in the Specialist module and shall incorporate generic configuration control terminal software and map sets to replicate typical system responses and visual displays the student would normally observe at a supervisor's/administrator's console. Configuration changes executed by the student in the capacity of system administrator shall result in expected changes to the designated operator position(s).

The SA course shall emphasize the mechanics of moving through the configuration events. The system administrator shall understand the flow of data input to get the operational system up and running initially. When completed, the product output would teach the student to perform each item in the System Administrator's handbook and the order in which they should be accomplished. Each functional event need not be instructed specifically; however, with the use of the System Administrator Handbook in conjunction with the SA module, the System Administrator will be able to perform each function.

C3.8.7 Validation of Training Courses

C3.8.7.1 Contractor's Presentation

The Contractor's presentation (DID-14, FAA-STD-028C) is a formal step in the validation of the training materials. During the presentation, the Contractor shall present a shortened version of each fully developed lesson, including draft test items. Each lesson shall be given in enough detail and depth so that the integration and effectiveness of the instructional materials, learning sequence, performance exercises, tests, and the time allocations can be fully assessed by the Government. The Contractor shall conduct a presentation for the AT Operator/Specialist, Hardware Maintenance, and the CBI courses. The presentation shall be conducted at the Contractor's facility using the materials that will be used in the actual courses. A minimum of four (4) and a maximum of twelve (12) Government personnel will participate in each walk-through course.

a. The Contractor shall correct the errors, omissions, and deficiencies in the student and instructor materials discovered during each Contractor presentation.

b. Materials shall be corrected prior to conducting any additional classes. The Contractor shall submit corrected copies of the course materials for Government review and approval. (CDRL TNG009)

C3.8.7.2 Operational Tryout and First Course Conduct

The Contractor shall conduct an operational tryout at a Contractor or Government facility for the AT Operator/Specialist, Hardware Maintenance, and CBI courses. If the Tryout course is accepted by the Government, the Government may waive the requirement for a first course conduct. In either case, Course approval will be contingent upon Government approval of the appropriate Validation Report. (CDRL TNG010, TNG011)

The Contractor shall submit a validation report upon completion of the operational tryout or First Course Conduct class for each course conducted by the Contractor. Validation data to include time required for conduct of the class, student evaluation, a student roster, and examination results as appropriate, shall be furnished to the Government (CDRL TNG010, TNG011)

C3.8.7.3 Training Course Conduct

When training is conducted at a Contractor's facility, the Contractor shall provide the equipment required for classroom and laboratory (i.e., hands-on) training, including all required tools, and support and test equipment.

a. For Government designated courses for Government training developers/instructors, the Contractor shall provide each class participant, a copy of all instructor materials (e.g., lesson plans, media materials, student guides course handouts, etc) used in the course. The class participants shall retain all materials issued to them. (CDRLs TNG005, TNG006)

b. For each formal training course presented to Government AFSSVS AT and AF specialists, the Contractor shall:

    1) Provide each student with a set of instructional materials, e.g., student's guide and documentation, for the course. The student shall retain all course and instructional materials issued during the course.

    2) Provide each student with a Certificate of Training. The certificate of training shall be in the Contractor’s format and contain as a minimum: course title, hours of training completed, location of the training, class start and end dates, student's name and social security account number, and course grade (pass/fail) attained. (CDRL TNG012)

3) At the completion of the course, the Contractor shall request each student to complete a Government provided end of course evaluation/critique form. (CDRL TNG013)

4) Provide the Government a Class Roster, a copy of each student's Certificate of Training, and a copy of the completed End of Course Evaluation/Critique forms. (CDRLs TNG012. TNG013. TNG014)

C3.8.7.4 Delivery and Revision of Materials

The Contractor shall deliver all training materials to the Government without restrictive legend. The Government will retain the right to copy/distribute all training materials needed to support Government AFSSVS training. The Contractor shall deliver all course materials as specified in the CDRL (i.e., in hard copy and on CD-ROM or DVD in the software format, e.g., Microsoft Windows 98, used by the Government at contract award).

C3.8.8 FAA Academy AT Training Simulator

The Contractor shall deliver and install an AFSSVS simulator that will support the communications requirements of the flight service initial qualification-training program at the FAA Academy in Oklahoma City.

a. AFSSVS simulator equipment shall include:

(1) GFE OASIS consoles;
(2) AFSSVS position equipment (e.g., touch entry device)
(3) 16 positions;
(4) 1 lab manager (supervisor) position;
(5) A jack module (consisting of receptacles for student and instructor headsets) at each position;
(6) An automatic call director/voice retrieval system (ACD/VRS) functionality;
(7) GFE headsets and footswitches.

b. AFSSVS simulator capabilities shall:

(1) Have the equipment, functionality and CHI features identical to those found at a fielded AFSSVS operator/specialist position.

(2) Have the capability whereby the instructor can contact the "remote" position and the remote position will be able to identify that the communication is coming from the instructor and not part of the scripted lab exercise.

(3) Have the ability at each of the 16 operational (student) positions to record all communications; and provide the instructor the ability to immediately playback the

recorded verbal communications at the position to critique the student's performance at the conclusion of the exercise.

(4) Have a minimum of 32 separate dedicated recording channels (2 per position). The 32 channels shall allow each student to record two separate broadcasts (e.g., Hazardous In-Flight Weather Advisory Service (HIWAS) and Transcribed Weather Broadcast (TWEB)) during the Broadcast lab.

(5) Allow the lab manager (supervisor position) to configure/reconfiguration the simulator and to designate/place positions (student and remote) anywhere in the lab to meet specific lab exercise requirements.
- Each of the 16 positions shall have the capability to function as a normal operational position or to serve as a remote position. The two most common configurations are:
  - 8 operational positions and 8 remote positions, or
  - 16 positions configured to be operational positions
- When configured as 16 operational positions, each position shall interface with the ACD/VRS or have the ACD/VRS functionality.

(6) Enable the student to communicate with the remote through radio, direct access, indirect access, and PDX phone dial up communications. There shall be an indication at the remote position to indicate whom the student is calling (i.e., a Center, Customs, Flight Data, Remote Communications Outlet (RCO 122.0), etc.,) so the remote operator can respond appropriately.
- Conversely, calls generated from the remote position (i.e., simulated A/G or G/G) shall appear at the student position as if they were actual incoming A/G or G/G calls.

(7) Provide the capability for one or more position(s) to monitor another position.

(8) Provide the capability for an instructor to monitor/override a student position in the same manner as it is performed at a field site.

(9) Provide the capability for a third person (e.g., another instructor or a supervisor) to monitor a single position while at that position. A headset jack module that will accommodate three headsets will allow new instructors to be trained or a supervisor to monitor instructor performance.

c. The Contractor shall conduct a detailed site survey to determine the AT simulator's configuration and Contractor/Government site preparation requirements. The Contractor shall deliver the completed site survey report (CDRL IMP005), including the completed site survey worksheets to the Government.

d. The Contractor shall perform a Site Acceptance Test (SAT) to demonstrate that the AFSSVS simulator is operational and functions as described above. Acceptance of the simulator by

the Government shall occur after successful completion of SAT and receipt of the final SAT report. (CDRL TES007, IMP006)

C3.9 Configuration Management (CM)

The Contractor shall provide the Government a copy of their Configuration Management Plan (CMP) with the AFSSVS Technical Proposal. If the Contractor has an ISO certified CMP/process, the Contractor shall provide a copy of the Certificate with the CMP.

The Contractor shall implement an internal Configuration Management program on all AFSSVS hardware, software, firmware and documentation for the life of this contract in accordance with the provisions of an ISO Certified or a Government (i.e. FAA-STD-021a) approved CMP. The Contractor shall assign an experienced Configuration Manager to the AFSSVS program. The Configuration Manager shall be the Contractor's point of contact for all configuration management related issues. (CDRL CMP001)

C3.9.1 Configuration Control

The Contractor or Government may initiate a change to an approved baseline. Contractor initiated changes to the approved baseline shall be submitted to the Government for approval in accordance with the contract, e.g., Engineering Change Proposal (ECP), Deviations and Waivers, as applicable. In addition, the Contractor shall submit design change notices (DCN's) to implement approved ECPs into the engineering data for provisioning (EDFP).

Internal configuration control procedures shall include maintaining and continuous updating/posting of approved ECPs to the escrow account so it reflects the current approved AFSSVS configuration. (CDRLs CMP005, CMP006, LOG005, TES008)

C3.9.2 Configuration Audits

The Contractor shall include a configuration audit plan as an appendix to the CMP to support the conduct of AFSSVS functional configuration and physical configuration audits (FCA/PCA). For the FCA and PCA, the Contractor shall prepare an agenda, record the findings, and provide the Government a report(s) on the results. (CDRL CMP002)

C3.9.2.1 Functional Configuration Audit (FCA)

The Contractor shall prepare and submit an agenda for the FCA to the Government for approval. During the FCA, the Contractor shall demonstrate to the Government that each AFSSVS function configuration item (CI) performs in accordance with the AFSSVS Specification. The Contractor shall record and analyze the findings, and provide the Government a report on the results of the FCA. (CDRL ADM001, ADM002, CMP003)

C3.9.2.2 Physical Configuration Audit (PCA)

The Contractor shall prepare and submit an agenda for the PCA to the Government for approval. During the PCA, the Contractor shall demonstrate that each AFSSVS physical configuration item (CI), 'as built" equipment configurations, and technical documentation conform to the AFSSVS Specification. The Contractor shall record and analyze the findings, and provide the Government a report on the results of the PCA. The Government will establish a product baseline after approval of the PCA report. (CDRL ADM001, ADM002, CMP004)

C3.10 Quality Control Program

The Contractor shall provide the Government a copy of their Quality Control System Plan (QCSP) with the AFSSVS Technical Proposal. If the Contractor has an ISO certified QCSP/process, the Contractor shall provide a copy of the Certificate with the QCSP).

The Contractor shall be required to maintain a quality control system for all aspects of the AFSSVS contract in accordance with an ISO Certified or a Government (i.e., FAA-STD-016a) approved QCSP. (CDRL QCP001)

C3.11 Security Requirements

C3.11.1 General

The contractor shall support activities necessary to achieve and sustain AFSSVS certification and authorization by the Government Designated Approving Authority (DAA) in accordance with FAA Order 1370.82, Information Systems Security Program.

The contractor shall use the AFSSVS Protection Profile as a basis for the preparation of an AFSSVS Security Target (ST). The ST shall be prepared and delivered in accordance with CDRL SEC001.

C3.11.2 Security Measures

The contractor shall accomplish the following steps to ensure the physical and operational security of the AFSSVS.

a. Develop a security certification process, which ensures that only authorized personnel have access to software codes, documentation, passwords, authentication processes, hardware, and associated components of the AFSSVS during installation and testing.

b. Safeguard all AFSSVS systems and components, including hardware, software, and documentation not yet installed in Government facilities against damage, pilferage, and unauthorized access or modification.

c. Deliver, install, and test AFSSVS systems and components in a manner that maintains security against damage, pilferage, and unauthorized access or modification.

d. Protect sensitive data, software, and hardware from unauthorized disclosure, access, or corruption at all times during production, storage, delivery, and installation. Notify the Government immediately if unauthorized disclosure, access, or corruption occurs.

e. Document and review all software changes to ensure that security is not compromised.

f. Provide each AFSSVS with secure installation defaults during delivery and installation.

g. Provide AFSS administrators authorized by the Government with the capability of customizing the default security parameters at any time during the installation process.

h. Provide the Government with procedures for testing delivered software to ensure that it is exactly as specified in the master copy.

i. Develop a security plan in accordance with CDRL SEC002.

j. Ensure that all contractor personnel employed in the development, implementation, installation, maintenance, and upgrade of the AFSSVS meet the following criteria:

(1) Have the expertise necessary to perform the security tasks associated with design, installation, implementation, prevention, detection, containment, and recovery and security administration.

(2) Have undergone a documented formal process before being deemed “responsible.” This process may include interviews, reference checks, and/or background checks.

(3) Are adequately trained in AFSSVS development, implementation, installation, maintenance, and/or upgrade as appropriate.

(4) Are held accountable for their actions as part of the contractor’s employment policy. Regress may be accomplished by either legal or administrative actions.

C3.11.3 Vulnerability Assessment

The contractor shall provide the Government with guidance documentation that identifies all possible modes of operation of the AFSSVS, their consequences, and their implications for maintaining secure operation. This documentation shall also identify procedures and plans that enable the Government to test the security of the AFSSVS during operations. Possible modes of

operation shall include, but are not limited to those that occur following failure or operational error. (CDRL SEC003)

The guidance documentation shall also identify means of identifying and testing for new and/or additional vulnerabilities that appear during the operational life cycle of the AFSSVS.

C3.11.4 Testing Requirements

During first article test (FAT), the AFSSVS shall demonstrate the ability to successfully satisfy all the functional requirements identified in section 4.0 of the Protection Profile (Appendix D to the SOW).